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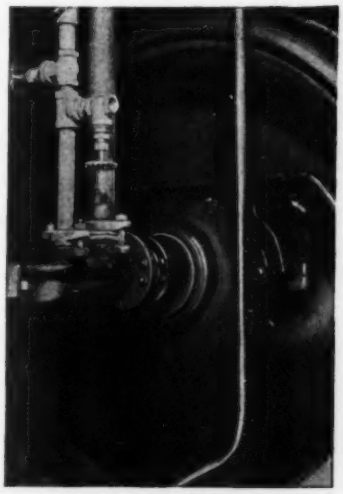

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THE PAPER INDUSTRY

MAY, 1935
Vol. 17—No. 2

A MONTHLY EDUCATIONAL JOURNAL
Devoted to the Interests of the Pulp and Paper Industry

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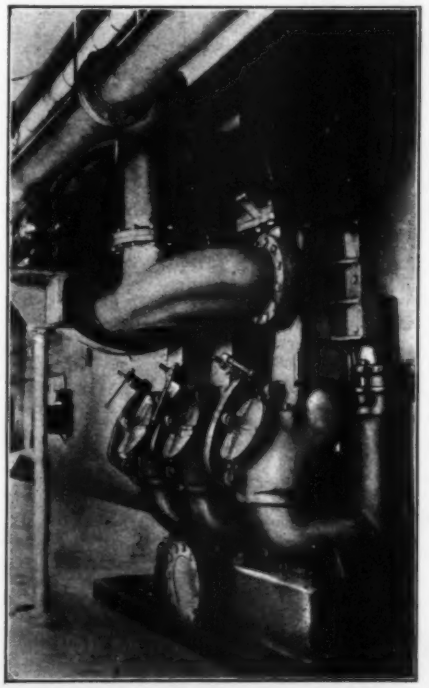

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Let Business Experience Be Your Guide

THE campaign that has been waged against the price schedules of the paper mills, by consumers and buyers of paper during the past ten months, has been signally ineffective. However, it has had a marked effect on the supply situation, which bodes no good to the same consumers and buyers. It has resulted in a complete clean-up of all excess stocks of commercial paper in every position. It has prevented any accumulation of inventories anywhere. It further prevented any bookings of large tonnages for future delivery. For no one had the temerity to buy for stock in face of such pronounced propaganda, "that paper was going to be cheaper."

So, here we are on May 1, 1935, with no reserve stocks anywhere, with the smallest inventories on record, and consumers still following a rigid hand-to-mouth buying policy, and the biggest inflation of commodity prices staring us bang in the eye.

Inflated prices are not yet to come—they are here now. Every month, the commodity index numbers are advancing, from one to two points.

A year ago in April, Moody's Commodity index number was 138. In April, 1935, it was 151—an increase for the year of 13 points. The Federal Reserve Bank commodity index number for April, 1935, was 121.92; for April, 1934, it was 107.60—a net advance for the year of 14.30 points. All of which means that if a man drew a thousand dollars out of his bank and invested it in commodities a year ago, he realized a thirteen point advance. The man, who left his thousand dollars in the bank on demand deposit got no interest and the purchasing power of his dollar in commodities today is only 87 cents.

There is on demand deposit in the Federal Reserve Banks approximately $19,000,000,000. How much longer will that huge block of idle money remain there drawing no interest, in face of a constantly slowly, but surely advancing commodity and equity market?

The wise ones are beginning to go with the economic tide and are already beginning to transfer demand deposits into advancing commodity investments. Pretty soon, the mass of money will move into activity and then the scramble to build up stocks, inventories, and reserves will be on. It always has been so—it always will be so. America did an eighty-billion-a-year business in the past—a hundred-billion-a-year-business is a future certainty for this country.

Oh, yes, we do realize that it is just as hard to convince people now that business is expanding and on the upswing again, as it was to convince people in 1929 that the peak had been reached and that business was headed for a bust.

Isn't it true that call money—millions of dollars of it—was loaned in the fall of 1929 at 20 per cent interest? Call money today is quoted at the all-time low record rate of one-quarter of 1 per cent and one couldn't get one-half of 1 per cent for $1,000 on call on this day of grace 1935. What's the difference?

In 1929, there were huge excess stocks of every kind of commodities and equities and cash was scarce. Hence, the 20 per cent call money rate then.

Nineteen thirty-five brings the barest shelves, emptiest warehouses, and meagerest stock of supplies and a huge supply of cash. Hence, the one-quarter of 1 per cent call money rate now.

Good judgment indicates a big warehouse filled with commercial papers to be a prime investment now.

+ EDITORIAL +

Might Have Been Worse

PAPER manufacturers as a group in some quarters have become known as chronic kickers. Whether they are deserving of such an aphorism must be left for themselves to decide. Nevertheless, some of them at least never seem to be satisfied with conditions. According to these individuals, the demand for their product is too slow; the cost of production is too high; the margin of profit, if there is any profit, is too low; competition is too severe; and all in all the pulp and paper business is a good business to stay out of.

However true some of these thoughts might be, it has been noticed that once an executive finds himself associated with a pulp and paper manufacturing organization in any capacity, it is seldom that he leaves the field. He may change positions and affiliate himself with another mill; but not often does he stay for long in another field of business enterprise, should he take it upon himself to seek an entirely new pasture.

It may be that such an executive finds the new pasture was no greener than the one which he left and that the smell of a sulphite, soda or sulphate mill, or the opportunity to feel the stock in a beater or to examine a sheet of paper as it comes from a paper machine was stronger than originally believed.

Maybe it is a more selfish interest that causes executives with capital invested in the industry to remain with it or to get back into it should they look elsewhere for their pot of gold. At any rate, this thought came to mind when reviewing a copy of a preliminary report of the Bureau of Internal Revenue on Statistics of Income for 1933. This report was compiled from income tax returns for 1933 filed to August 31, 1934, and revealed upon analysis of one tabulated statement a higher percentage of pulp and paper organizations filing returns showing net incomes than in any other field of manufacturing. These percentages as calculated from the table are: Food 32.8; Tobacco 30.1; Textiles 38.0; Leather 41.4; Rubber 38.7; Forest Products 24.1; Paper and Pulp 46.3; Printing and Publishing 22.7; Chemicals 31.8; Stone, Clay, and Glass 15.5; Metal 22.3; and Manufacturing not elsewhere classified 21.0. The percentage of Total Manufacturing figures 28.4.

Such figures indelibly portray the general condition of the business of manufacturing during the time specified within the country. Although none of the figures as a whole or in part are as attractive as might be desired, upon reviewing them, do they not indicate that conditions insofar as pulp and paper were concerned might have been worse?

Credit Where Credit Is Due

WHY is it so difficult for employee and employer alike to give credit where credit is due? The employee is dependent upon the employer for the opportunity afforded him to earn his livelihood, and the employer is dependent upon the employee for the accomplishment of certain tasks delegated to him. Both are essential to the well-being of the other. Putting it in a rather homely way, the employer may be likened to the hub of a wagon wheel and the employee to one of its spokes.

All of the spokes when properly attached to the hub and bound together with rim and tire make for a smooth running wheel. Loosely fitted spokes in a hub produce a creaky wheel and one that cannot be relied upon to carry a heavy load. Likewise, if a tire is set too tightly the wheel is dished and its native strength impaired.

So it is with a business organization if proper relationship does not exist between the management and the working force. There must be a tie to bind together these two vital divisions of a business in a proper manner. If the tie is not strong enough, the organization creaks with weakness; if too strong, like the dished wheel, there is insufficient freedom to exert its real strength.

Just as the tire of a wheel must be set properly to give the wheel greatest strength, so must a business be organized if it is going to function most efficiently. The organization, of course, must have disciplinary control, but this control must be neither too weak nor too strong. It should allow only such freedom on the part of the working force as will permit smoothest functioning of the entire organization commensurate with actual accomplishment. No doubt one of the simple ways of arriving at such a condition is to be willing at all times to give credit where credit is due.

◆ THE SIXTEENTH annual convention of the American Pulp and Paper Mill Superintendents Association is scheduled to be held on June 5, 6 and 7, 1935, in Richmond, Va. All members of the association and others who are interested in the activities of this organization should keep these dates in mind and should make plans to be in attendance at these meetings. It should be recalled that the association's eighth convention was held in Richmond in 1927. The success of that meeting and the return to Richmond for the 1935 convention speaks well for the city and for those responsible for promoting its selection.

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CURRENT THOUGHT

Look Out For Inflation!

By WILLIAM SIBLEY

IN THESE days of swift changes and drastic upsets, any writer who gives voice to economic prophecy is either amazingly courageous or downright foolhardy. Perhaps I am a little of both, because this month I am going to stand on this editorial page and shout: "Look out for inflation"!

Inflation is coming. Economists have been talking about it for a long time. Most of them still say "sooner or later." I make so bold as to say—the latter part of 1935, probably; not later than 1936—but certainly.

There are several reasons why we are now on our way to both price and currency inflation. Perhaps the first one is the recent devaluation of the dollar. Because of that we now have a gold currency base more than twice as large as the base which supported the 1929 boom. Second: we are incurring huge governmental deficits. These deficits are now so large they preclude the possibility of a balanced budget; they are admittedly out of proportion to repayment possibility save by inflation or war. Thirdly: our public works expenditures are becoming astronomical in size. Fourth: the Federal Reserve is now making large open market purchases of government bonds. Fifth: stupendous governmental loans to both industry and agriculture. Sixth: large and probably greater purchases of silver for the purpose of enlarging the base for currency expansion. Seventh: the Banking Act of March, 1933, empowers the Government to issue a currency to pay for unlimited obligations. Eighth: many more inflationary measures are planned, such as the issuance of non-interest-bearing currency in exchange for bonds; old age pensions; soldiers' bonus; unemployment insurance; and many other adventures which will stack the deficit billions higher.

Yes, we are on our way to inflation. We started in March, 1933. And if you will study the history of currency or credit inflation anywhere in the past you will find that this insidious disease "takes" slowly. Invariably it requires from one to two years to "get going." We will probably feel the effects of our early inflationary measures this year. The things we did during 1934 will doubtless yield their harvest during 1936. There is no space here to discuss these conclusions academically. I am merely presenting facts which we in the paper industry have serious need to consider. Let us all realize that inflation is coming, quickly—and weigh the possibilities of self-protection.

During prosperity, the saving of money is a prime requisite. During a depression, hoarding is a sound precaution. During inflation these two measures would be ruinous. Because of rapidly advancing prices and falling purchasing power, inflation commands that we buy such forms of property as may be expected to increase with the price spiral and thereby steady purchasing power depreciations. There are several such forms of property—such as:

Foreign currencies—But in the coming inflation this would be a precarious purchase since doubtless all major powers will likewise experience inflation in varying degrees of intensity.

Bonds and Stocks payable in foreign currencies—For which the above warning holds equally true.

Domestic real estate—Ordinarily a very desirable hedge, but this time subject to usurous taxation; plus offering the disadvantage of slow liquidation and costly depreciation.

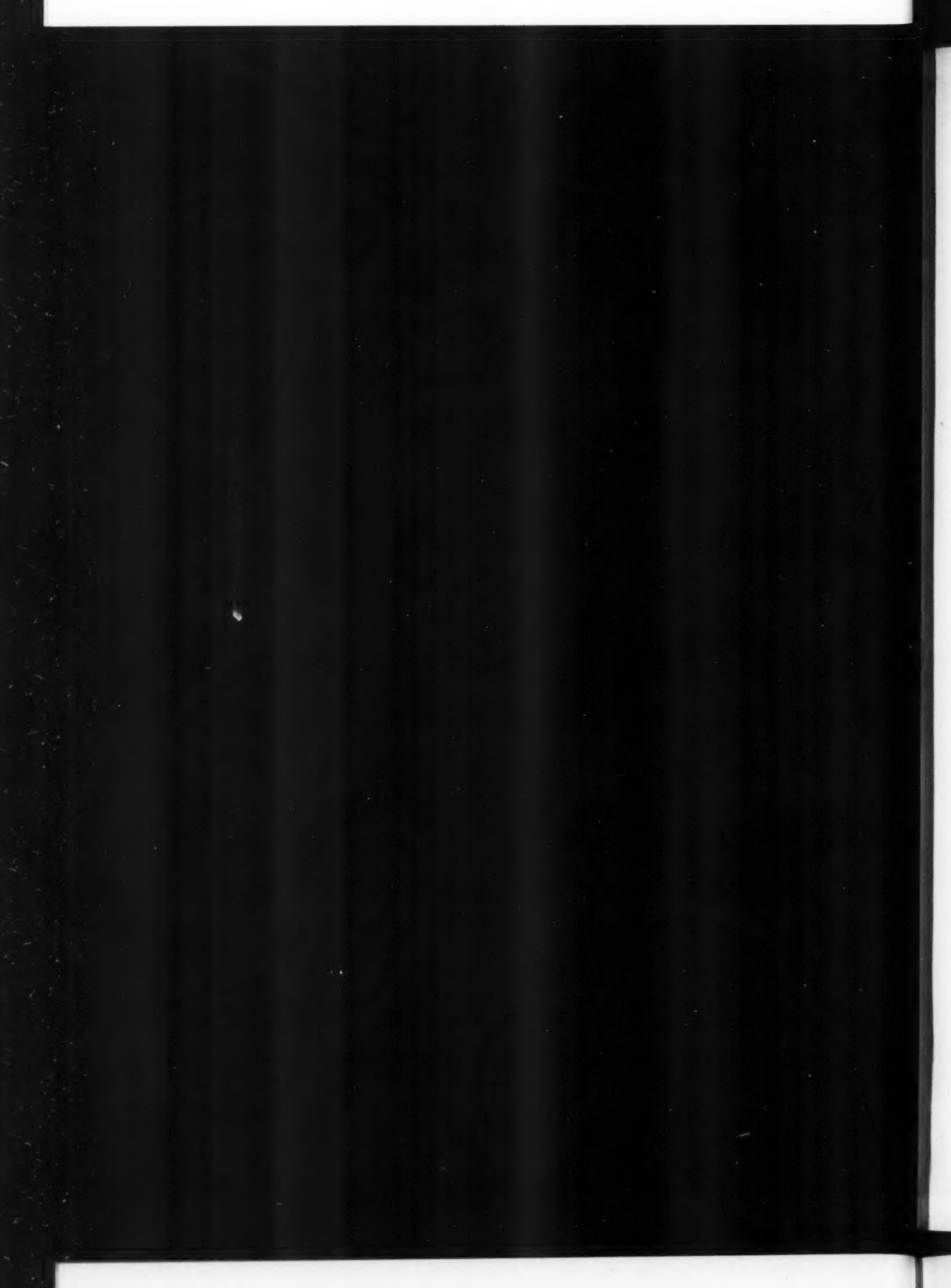
Domestic commodities—A very good hedge for all who can afford the warehousing and maintenance expense. Many paper mills might be entirely justified in increasing production now, merely to pile up an inventory at present comparatively low prices.

Domestic common stocks—Perhaps the best of all hedges providing intelligent selection is exercised. They offer quick liquidation; low taxation; capable collateral; no depreciation. In considering common stocks, however, it might be well to forget the corporations which are subject to governmental control, such as railroads, utilities, etc. The hand of government control is always heavy to the point of bruising if not crushing. So also, avoid stocks in the giant companies. Our present administration has a peculiar complex about "big industry." For the large companies this government is unpredictable.

Corporations which necessarily employ a high percentage of expensive, skilled labor; which are subject to either labor-union strikes or consumer boycotts; or which produce products subject to price control, might also be classified among the stocks to avoid for inflationary hedging.

There are plenty of medium sized corporations outside these "don't" classifications, and purchases of widely diversified blocks of such common stocks would probably be as capable a shield against the devastating, value-destroying inflation as one could readily pick up.

This isn't a pleasant subject to write nor to think about. There is more fun and zest to writing and reading about something cheerful. And the prospect of inflation is far from cheerful; it is soberingly sombre. But this is a fact we have to face: we are rapidly entering a period of boom prosperity which will have for its substance sheer inflation. The more preparation we make for it, the better we will survive it.



THE PAPER INDUSTRY
A MONTHLY EDUCATIONAL JOURNAL

Maintenance Methods

EDITOR'S NOTE—The chief engineer of a prominent pulp and paper mill organization presents in this article an outline for the establishment of a workable, standardized maintenance plan. The article has been written exclusively for publication in The Paper Industry.

THE problem of maintenance in a pulp and paper mill is one of management's problems, to which can be readily applied, with some modification of detail, methods and procedure in general use in other industries. For many other divisions of pulp and paper production this is not so true, due largely to the variations in raw materials, lack of precise knowledge of those raw materials and the finished material (the organic product varying from day to day), temperature, atmospheric changes, etc., and the enormous amounts of carrier material, that is, water, that must be handled, for a small amount of salable product.

Since the value of repair materials, common supplies plus the labor for applying and utilizing this repair material, can amount to from 8 to 15 per cent of the total cost of manufacture, it is clear that the difference between first class handling of maintenance and mediocre methods of doing the same, represents a large sum, with substantial effects on profits. Not only is the difference largely due to the actual cost of labor and maintenance material, but also due to the time element when some part of the producing machinery may be down for unanticipated repairs.

Maintenance should be considered in two divisions: *First*, inspection; *Second*, repair and replacements.

The first division is too rarely set up as a standard procedure. It is generally casual to say the least.

The second is always carried out in some form with some sort of personnel and tools. Many times it lacks records, schedules, storeroom and budgeting—all essential to low maintenance.

It is difficult to say which of the many factors should be considered first. Probably personnel, as in small mills, with extra good leadership, maintenance is no doubt handled fairly well, with many of the other listed requirements missing.

Personnel

The maintenance department should be headed by an able, all around executive engineer, preferably with a thorough machine shop experience outside of the pulp and paper industry. In addition, he should have a working knowledge of electricity, construction methods, steam, hydraulics, a sense of order; the ability to ask "Why?" and a personality which will permit him to investigate break-downs in all departments, and the cause thereof, without creating in the minds of any of the department heads the thought that he is finding fault.

The listed qualifications would seem to call for a superman. That is hardly necessary, as the maintenance man's job is to maintain up to standard what has been installed and selected by others to perform certain functions, and when so maintained this man's duties are performed.

He must have machinists, carpenters, sheet metal men, pipe fitters, welders, steel workers, painters, electricians, instrument men, and concrete workers; and in small plants, millwrights—that jack of all trades who can do a fair job in almost any line, though rarely up to the quality of work that can be done by a specialist in any particular branch.

In the office of the maintenance man are required draftsmen, timekeepers, storekeepers, schedule men, safety men, inspectors, and dispatchers.

Needless to say, these men should be high class in their respective fields and adaptable as they must work in many departments under the close scrutiny of producing men, who at heart often think themselves better at maintenance work than the regular force.

Inspection, Records and Planning

Standardized inspection is absolutely essential to first class maintenance, and far too often is neglected, dependence being placed on the production force to complain of defective working, or on observation of oilers or others not conversant with production requirements; also the memory of repair gang foremen.

The importance of adequate inspection is best shown by its success in railroad operation, trucking fleets, aeroplane service, etc. A very plain example of careful inspection is before all of us in the performance of the Factory Mutual or the boiler insurance companies. In the fifty years or more of the life of these companies, such inspection from Factory Mutual men with follow-ups of their inspection reports has reduced insurance costs from an average of 63 cents per hundred dollars to a little over one cent per hundred dollars.

Inspection service starts with a card index showing in considerable detail every machine, device and building, the time of acquisition, the cost, the functions to be performed the probable life expected, and a record of defects found with replacements and repairs.

This card index provides a place for the record of changes and inspections; in fact, carries a complete journal account against each structure and device. It can, of course, only be made up after study of all orders, specifications, etc., consultation with the department heads interested and the users of the device. Such cards are classified as to function, location, type of labor required for repair, spares that are carried, and probable interval of repair. From this is built up a series of routes for several classes of inspectors. For instance, a man valuable for inspecting belting probably would not be of much use on flow meters. These cards are instrumental in building up a series of standard repair methods, which, of course, are varied from time to time as acquaintanceship with operating conditions increases.

The duties of the inspectors are to go over the devices or parts at recorded intervals, note departures from the standard, and ascertain when the device probably will be available for repairs, in every way anticipating future trouble. Much inspection work probably must be done on Sunday, or such times as the plant or department is down. Sometimes even duplicate equipment is necessary for adequate inspection. Routes, if carefully laid out, can save much time.

Routes, as well as inspectors, should be changed occasionally, and the maintenance head should supplement the work of regular inspectors by occasional inspections of his own. Inspection and criticism by department heads should be sought.

Inspection reports are turned in to the recording clerk and dispatcher, who classifies the work to be done and sets the time of repair in a preliminary way. Once a week, or oftener, a meeting of department heads and superintendent is held, when all major maintenance is discussed, precedence determined, and the time set for the work. In particular, incomplete repairs must be studied.

Such a precedence schedule is vital to the success of a maintenance department. Of course, such schedule is always subject to revision for emergency conditions, but it will be found that these emergencies disappear as careful inspection with prompt follow-up develops.

It is the duty of the dispatcher to assign men to the scheduled jobs, check completion, consult the storekeeper as to material for the job, and have always within easy reach an emergency crew for the unusual break-down.

The line between maintenance and production duties is not always finely drawn, and there must be give and take between the maintenance department and production heads. At one mill it is the duty of the maintenance department, rather than that of the papermaker, to change machine wires and felts. To make such changes without loss of production requires very close co-operation.

Another line that should be drawn more commonly is that between construction and repair. Low cost construction calls for assembling a trained crew, putting through a job on schedule, and then disbanding. If large construction is attempted by the usual maintenance gang, either maintenance must suffer or the crew must be enlarged, and pay rates affected. For construction work of any size it is best to employ an outside contractor.

Much time must be given to study of break-downs, especially the repetitive ones, so as to eliminate them from the field as far as possible.

Repairs

Without adequate tools and supplies, no amount of high grade personnel, or records, will perform satisfactorily. A well-filled storeroom, with a place for everything and everything in its place, located in a central position and accessible at all hours of the day or night, is a necessity. This storeroom should have records of what is on hand, with minimum and maximum stock allowances not to be exceeded set for each article; also lists of approximate quantities used per month or year, for the benefit of the purchasing agent. As a supplement to the main storeroom, often each department has a small storeroom containing some of the most frequently required emergency articles.

All material going from the storeroom should go out on requisition, and the requisition is not filed as complete until the replaced or damaged material is handed in or a certificate of its destruction or loss supplied.

Besides the usual list of portable tools kept at the storeroom, there should be a small equipment of tools for the rehabilitation of damaged articles, such as valves, bolts, belts, gauges, couplings and bearings, to be placed back in stock. Also, there should be a few rough test instruments—gauges, pyrometers, thermometers, etc.

The advent of new methods and materials in the past few years has necessitated a major change in the line of thought concerning methods of repairs.

Welding and acetylene torches in quite general use have displaced most of the riveting, cutting and pipe threading formerly used.

Streamline copper pipe with sweated joints again calls for a discard in pipe threading.

The metal spray gun just now coming into use for protective coatings and building up parts can restore worn shafts, etc., which formerly had to be wholly renewed.

An oilless rubber bearing for oscillating joints such

as wrist pins ultimately can replace many babbitted boxes.

Stainless steels, while of high cost, prolong the life of parts subject to corrosion from ten to twenty times.

Plywoods, treated lumber, special cements and rubber covering call for a technique in handling that the old repair crowds did not possess.

The advent of crimped sheet aluminum is another new maintenance material.

The above and many others make our old friends—hacksaws, drills and pipe-threading and keyseating equipment—spend most of their time on the shelf.

To attempt to go into methods of repair would require a volume or more. It is desired to emphasize that standard methods of repair should be adopted and strictly adhered to. At the same time, a repair recurring frequently should be studied, not from the angle of replacement, but from the angle of betterment to eliminate the particular undesirable feature that is causing the excessive maintenance. To cite a few:

(1) Concrete floors should not be merely patched where there is much traffic, but iron grids should be embedded in the concrete at the maximum traffic points.

(2) Open motors giving frequent trouble should be replaced with the wholly enclosed type.

(3) Foundation bolts loosening in concrete should be studied for side thrust to be taken up by iron blocks embedded in the concrete presenting a large surface to side pressure.

(4) Machines frequently started and stopped, having high motor upkeep, should have motors replaced with high torque starting type.

(5) Brass material lasting only a short time should be investigated for zinc content and the pH of the liquid in contact, as dezincification is a very common source of weakening of brasses or zinc bronzes.

(6) Tanks and wood pipes with limited life should be restored with either better bottom ventilation or arranged so that the lumber always will be fully saturated, in which case rot occurs only slowly.

Some of the very frequent causes of trouble are:

(a) The erection of piping with too little expansion provision.

(b) The operation of belts too wide for the pulleys.

(c) The substitution of grease for bearings designed for oil.

(d) The setting up of packing with a wrench when the whole design of the packing is only for finger tightness.

The standard methods previously mentioned would, of course, cover these points and many others.

Budgeting

A department repair budget is one of the most important factors in obtaining low cost maintenance. This, of course, must initially be set up in a conference between all concerned, and after a sufficient period of trial should be modified, as the departure of the original estimates from what actually occurs is better known.

In setting up such a budget there must be considered, of course, the cost of carrying spares, cost of waiting for repairs, substitutes, etc. It is claimed by some that a budget tends to make repairing too rigid, and sometimes causes unnecessary break-downs because of failure to make early repairs, in order to keep within the monthly budget. This is where careful inspection enters in. Like any tool or method, budgeting must be used with a large measure of common sense.

Standardization of Method Difficult Task

The initiation and development of a maintenance department along the lines indicated will always be found a difficult task, each department head having a thousand reasons why he should retain the repair force he has always had at his beck and call. Generally, such a force is far too large for normal maintenance, kept so in order that the operator may have available sufficient men for emergency repairs. By having a central maintenance department and counting on the time of emergency in one department as rarely coinciding with the emergency in another department, the total repair men in a central maintenance force can be materially less than the total of individual departmental men. Further, the quality of work done by a central department is generally distinctly better than that done by individual maintenance crews, because specialists can be kept for various grades of work which would not be possible with a number of small repair gangs.

The demand that the operating man usually makes, that he must have a repair man on hand for the numerous small jobs which it would really take more time to requisition than to perform, can be met by having one repair man on the payroll of the central maintenance department and responsible to the maintenance engineer assigned to each manufacturing department, to take his orders for work from that department head. While this somewhat violates the old adage that "No man can serve two masters," it has been found to work out well in a good many cases.

As stated, the pulp and paper industry has been slow to adopt standardized methods. While there are some very good reasons for this slowness in production departments, there is no real reason for not standardizing on maintenance methods. Standard maintenance methods are carried out in almost all other industries, and the sooner the pulp and paper industry adopts that method the lower its costs will be.

◆ ◆ ◆

Paint . . . Its Composition

The necessity for having knowledge of the composition of paint is expressed in an article entitled "Protecting Steel Against Corrosion," published recently in *The Dutch Boy Quarterly*. Following is an excerpt:

A knowledge of the composition of a paint is of primary importance in enabling the buyer to judge for himself in advance whether or not a paint is suitable for the purpose for which it is offered. Today there are available many different kinds of paint varying in price, consistency, chemical composition and durability, frequently sold under proprietary names. Many virtues are claimed for them, which in some cases are justified and in others too optimistic. In many cases the composition of the paint is not stated and there is always an element of risk in using any material of unknown composition. . . . . The buyer is entitled to know what a paint will do *before* instead of *after* he has used it. If the composition of the paint is unknown to him, he cannot appraise its true value and worth.

Unemployment Compensation . . . Reserves or Insurance?

R. B. HIBBARD
Unemployment Compensation Department
Industrial Commission of Wisconsin

THE passage of the Wagner-Lewis-Doughton Social Security Bill by the United States House of Representatives is an impressive indication that unemployment compensation is about to become an established fact, one that will vitally affect the business of each employer. There is every indication that unemployment compensation is about to leave the realm of the academic and will be required to justify itself in practical fields. This legislation may take one of two general lines, based on two distinct aims and philosophies of action.

One philosophy is concretely expressed in what is properly termed *Unemployment Insurance.* A bill embodying this philosophy was presented to the legislature of the State of Ohio two years ago, was passed by the Assembly, but was not reported out of committee in the Senate. In New York State, such a law has just been signed, and Washington has passed such a measure which will become effective if the Federal Social Security Bill is passed.

This type of legislation, as the name implies, is an attempt to apply the principles of *insurance* to the alleviation of wage losses due to involuntary unemployment. Carried over from other insurance fields is the idea of spreading the risk to assure adequate protection. Many opponents of such insurance measures have questioned, perhaps with justice, the possibility of working out an actuarially sound basis for such legislation. The answer is quite clear—that no one can prove his case either way until a trial has been made.

Under an insurance measure, a uniform contribution is levied on all employers to be paid into a single pooled fund, maintained and invested by the states, from which fund benefits are paid to any eligible unemployed applicant upon presentation of a claim. Contributions continue indefinitely and, as a consequence, may easily assume the aspects of a simple tax on selected persons for unemployment relief purposes.

Nearly all advocates of reasonable unemployment compensation measures have come to recognize that such plans must be self-sufficient and distinct from relief measures financed by general taxation. If this end is to be achieved, such laws must limit their benefits to the contributions paid by employers. It is now conceded that unemployment compensation legislation of any moderate type cannot be expected to provide security against major periods of depression and unemployment, which, in any event, are entirely beyond the control of any single employer. Unemployment compensation *will,* however, re-allocate the burden of seasonal and irregular employment which is now borne almost entirely by workers.

If one studies the most probable working of a simple unemployment insurance plan, there appears to be a course of development somewhat as follows: Suppose that Employer "A" is engaged in a business which is quite regular from season to season, that he never employs less than 90 men nor more than 110 at any time during the year, and that his annual payroll amounts to $100,000 per year. Being a public spirited citizen, when business is dull, he spreads his employment to assure each man of no more than two weeks lay-off per year. Under the usual waiting-period provisions of such laws, none of his employees will draw any benefits whatsoever from the pool. At a 3 per cent contribution rate, he will pay $3,000 into the pool each year.

On the other hand, Employer "B" is confronted with a situation of irregularity which he may be unable or unwilling to correct. Due to his irregular employment, his annual payroll is only $50,000, just half the annual payroll of Employer "A," while he is forced to lay off 50 employees per year for a sufficient period of time so that they average $50 of benefits each. Each year, therefore, he contributes $1,500 to the fund, while his employees withdraw $2,500. Is it not likely that Employer "A" might justly feel disgruntled that the additional contributions he pays because of his steady employment and the saving he creates by preventing his employees from drawing on the pool should be lost through the irregularity of another employer, who because of that irregularity pays only half as much?

Suppose now that Employer "B" sees an opportunity to fill the gaps in his production schedule by producing a sideline at the cost of some research and administrative expense. Is he likely to do it? If he keeps his men at work longer, his payrolls and, as a consequence, his contributions will increase. He may even find himself in the unenviable position of Employer "A"—paying the cost of some other employer's irregularity. Unless there are material profits in sight through the production of the sideline, his tendency will be to let it slide and leave his men on the pool.

Modifications of the insurance plan have, of course, been suggested to eliminate this tendency by a merit-rating system such as is now rather widely used in connection with workmen's compensation (accident) insurance. However, the rewards of stability under a merit-rating system are uncertain and are, therefore, only effective for stabilization to a limited extent.

It is the tendency of insurance, even though alleviated to some extent by merit-rating, to discourage and even penalize stable *employment* in the effort to secure adequate benefits for *unemployment.* The second philosophy of unemployment compensation finds its expression in unemployment reserves plans, which reverse the above emphasis, by making each employer responsible for his own employees, placing on his own shoulders the cost of irregularity, and rewarding him directly for his stabilization.

Unemployment reserves legislation requires that each employer, insofar as possible, accumulate and maintain a separate Unemployment Reserve Fund from which he will pay benefits to his own employees based on their

length of service with him. It is a basic principle of such plans that no employee of any one employer can under any circumstances benefit from another employer's reserve fund. A reserve plan will stipulate from the beginning the duration and maximum amount of contributions which will be necessary if no benefits are paid from the fund. (In Wisconsin, an employer ceases to make any further contributions when his fund reaches an average reserve level of $75 per employe.)

It is this provision—setting a goal for all employers whose attainment will mean a very real saving—which distinguishes unemployment reserves from unemployment insurance. Advocates of the reserves plan feel that the possible inability of certain particularly irregular employers to pay promised benefits from their funds will be more than offset by the forward strides which a greater number of employers will make in the direction of steadier employment when such an inducement is afforded them.

It should be noted that the reserves system does not abandon every element of insurance. While reserves are segregated by employers, it is nevertheless true that any employee may be permitted to draw on his employer's fund for benefits to the extent of his rights as long as there is money in the fund. Unemployment resulting from complete shutdowns is comparatively rare, and this measure of pooling, therefore, represents a very material protection for employees which is easily overlooked.

It is interesting to note that the only unemployment compensation law which is at present in actual effect in the United States is that of the State of Wisconsin. Employers in that state have been contributing since July 1, 1934. Benefits under that law will be payable based on employment after July 1, 1935, allowing a year for accumulation of reserve funds. Utah has a similar bill which is conditional on the passage of the Federal Social Security Bill. Of the first ten ranking states in paper production in the United States three have already committed themselves to unemployment compensation to some extent—New York and Washington to insurance, and Wisconsin to reserves. The industry in other states will do well to give some thought to the type of measure which will best suit its needs, bearing in mind that such legislation may be designed to function as a preventative as well as a palliative.

Pending federal legislation must be considered in connection with any proposed state action, since it is designed to provide the Federal Government, through the use of its taxing power, with the right to approve or disapprove state laws and, in an indirect manner, to dictate their terms.

A part of the Social Security Bill as passed by the House of Representatives imposes on employers of ten or more persons an excise with respect to employment which will, after three years, be equal to three per cent on annual payrolls. However, employers whose payrolls in any given state are subject to contribution under a state unemployment compensation law approved by the Social Insurance Board to be created under the bill may offset such contributions against the excise up to 90 per cent of the full amount of the tax. This offset provision is the focal point of the unemployment compensation section of the Social Security Bill; and, since the conditions under which the offset may be granted will in large part determine the nature of our state laws, it merits careful consideration.

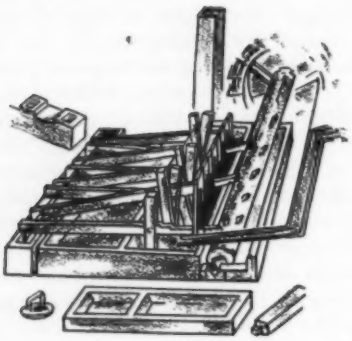
Although there were many advocates of a purely national system of unemployment compensation, the Committee on Economic Security which drafted this bill in its original form chose the type of enabling or compelling legislation represented by the bill in its present form, so that the several states might draw and administer their own laws within limits determined by standards of effectiveness and considerations of uniformity. It was with the avowed intention of permitting states to adopt the type of unemployment compensation measure which best suit their particular needs that the bill was originally presented to Congress.

To provide for the possibility that certain states might desire to choose between the reserves and the insurance systems, the bill as presented contained an additional offset provision whereby an employer whose standard rate of contributions might be scaled down to 2 per cent by reason of his having reached a required reserve level might continue to offset the standard 3 per cent contributions against the federal tax as if he had actually paid the full standard rate. This provision would permit a state to hold out to its employers the possibility that their required contributions under the state law might be reduced, or even cease altogether, depending on the effectiveness of each individual employer's efforts to reduce the incidence of unemployment among his own employees. The bill as originally introduced did not, however, permit any state to use the reserves system exclusively, since it required that each employer pay at least 1 per cent of his payroll at all times into a pooled fund, whether or not his own reserve fund were adequate.

However, the Social Security Bill was much modified in the course of the hearings before the Ways and Means Committee of the House, the most striking and important of the changes being the complete elimination of the additional offset provision. It is difficult to regard this change as anything else but unfortunate, since it completely and finally eliminates from the field of state experimentation the whole reserves system with its basic philosophy of prevention. Furthermore, in eliminating reserves, the removal of this provision also destroys any possibility of merit-rating even under insurance plans. There would be little point in a state permitting an employer who could show favorable employment and stabilization experience to contribute at a reduced rate if the reduction would immediately be absorbed by federal taxes.

There can be little doubt that federal action in this field will greatly accelerate the use of unemployment compensation in states which might otherwise be deterred from action by the burden of pioneering in such a field, but does it follow that it is necessary for the Federal Government to preclude a state from following its best judgment as to methods before either reserves or insurance can have had a trial? It would be unfortunate indeed if the federal measure should commit all states to legislation which may discredit the whole movement and, at the same time, throttle the growth of a type of legislation which has as its purpose prevention and the effectiveness of which, compared with insurance measures, is as yet untried.

Paper Sketches---



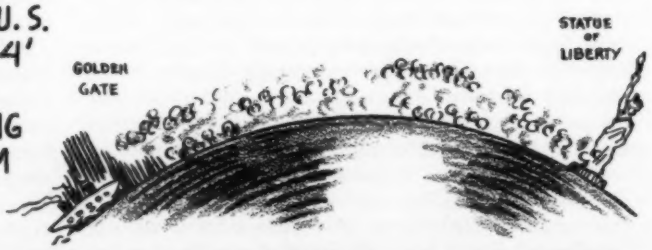
ONCE THEY LEARNED THE ART OF PAPER MAKING, IT TOOK EUROPEANS LITTLE TIME TO SUBSTITUTE THE WATER-DRIVEN STAMPING MILL FOR THE 1,000-YEAR-OLD MAN-POWER MACERATERS OF THE EAST. BY 1151, XATIVA, SPAIN HAD A POWER-OPERATED MILL. PICTURED ABOVE IS A TYPE EARLY USED.

TO GIVE PAPER THE SURFACE NECESSARY TO TAKE INK PROPERLY, THE ORIENTALS OF MEDIAEVAL TIMES SPENT MUCH TIME HAND-BURNISHING SHEETS WITH HIGHLY POLISHED STONES.

OVER 6,500,000 CORDS OF WOOD WERE USED TO MAKE PULP IN THE U.S. IN 1933. THIS WOOD IF CUT INTO 4' LENGTHS AND STACKED 4' HIGH, WOULD MAKE THREE PILES EXTENDING CLEAR ACROSS THE CONTINENT FROM THE STATUE OF LIBERTY TO THE GOLDEN GATE.

RENÉ ANTOINE DE RÉAUMUR

NOTED 18TH CENTURY SCIENTIST, MEMBER OF THE "ACADEMIE DES SCIENCES", AND NOBLEMAN OF FRANCE. HE EARLY STUDIED WASP'S HABITS, DISCOVERED HOW THEY MADE THEIR PAPER-LIKE NESTS, DISCLOSED THE SECRET IN HIS WRITINGS AND, IN 1719, ENCOURAGED PAPERMAKERS TO EXPERIMENT WITH WOOD AS A BASE FOR THEIR PRODUCT.



Pulp Viscosity Nomographs

D. S. DAVIS
Dale S. Davis' Associates

THE growing appreciation of the significance and value of the cuprammonium viscosity test, as applied to bleached and unbleached chemical pulps and to rag stocks, has led to its adoption in many paper and textile control and research laboratories.

The test is known as Cuprammonium Disperse Viscosity of Pulp, T 206 m and is approved by the Technical Association of the Pulp and Paper Industry as an official standard. Briefly, it provides for:

(1) dissolving the pulp in a solution containing 200 grams of ammonia (NH_3) and 15 grams of copper per liter in a concentration equivalent to one gram of oven dry pulp to 100 ml.

(2) measuring the time required for the level of liquid to fall between two marks in a tube of carefully specified dimensions, the effluent passing through a capillary, and the system maintained at 20 deg. C.

(3) calculation of the viscosity as a function of the measured time, the specific gravity of the solution, and constants specific to the tube.

The general relationship between the variables is

$$V = \frac{0.96}{C}\left(t - \frac{k}{t}\right)$$

where V is the viscosity in centipoises
0.96 is the specific gravity of the cuprammonium solution of pulp
t is the measured time of flow, in seconds,
and k and C are the gravity and tube constants, respectively. These differ from tube to tube and are previously determined by tests with glycerine solutions and water of known viscosities, as provided in the official standard procedure.

As an illustration of the use of Figure 1, consider the case of a bleached soda pulp which gave a test of 110 seconds when a viscosity tube was used which had gravity and tube constants of 860 and 8.20, respectively. Following the key, connect 860 on the k-scale with 110 on the t-scale and produce the line to the A-axis. Connect the point so found with 8.20 on the C-scale and read the viscosity on the V-scale as 12.0 centipoises.

In the case of unbleached pulps, such as hard sulphite and kraft, the time of efflux is much larger so that the term $\frac{k}{t}$ is small compared with t and may be safely neglected. This simplifies the expression to

$$V = \frac{0.96}{C}\,t$$

and enables the use of Figure 2 which permits the calculation to be effected in one operation.

Thus, the broken line in this diagram indicates that an unbleached soda pulp has a viscosity of 60 centipoises when the time of flow is 720 seconds and the tube constant is 11.5.

When adapting the charts for individual use it is helpful to designate the viscosity tubes by numbers and to mark these numbers opposite the proper values of the gravity and tube constants on the k and C-scales as illustrated by No. 12 and No. 8 appearing Figures 1 and 2. This is particularly advantageous where a number of tubes are in daily use since it prevents confusion of constants and attendant error.

Acknowledgment is made of several suggestions as to the data used herein, particularly those of Mr. M. D. Reuben of the York Haven Paper Co., who arranged the testing method for the Technical Association.

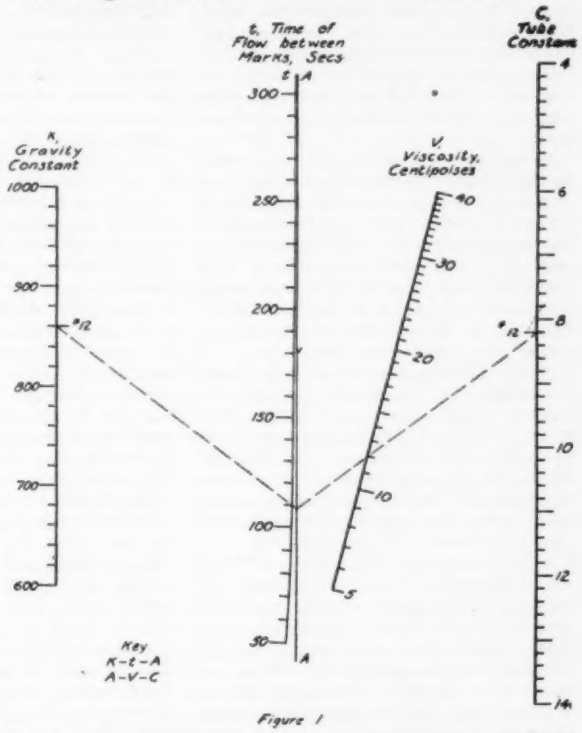


Figure 1

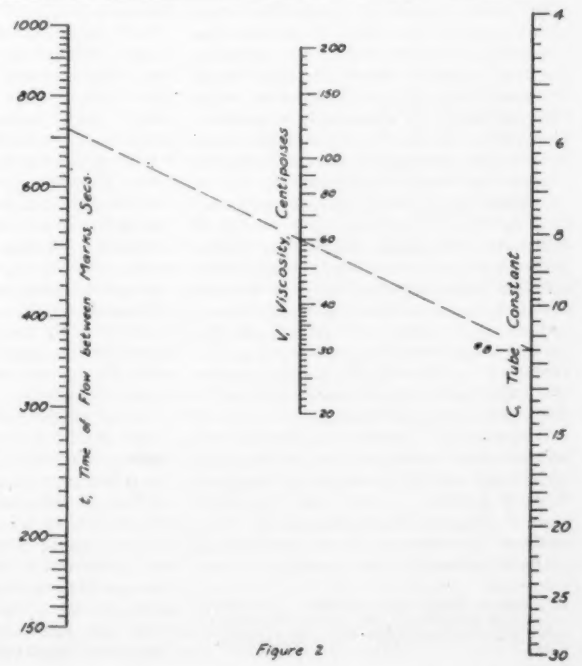


Figure 2

Pulp and Paper Mill Inventories*

MODERN cost accounting practice requires accurate inventories, for without them usages will be recorded incorrectly and the results reflected in the costs, impairing their value. This is particularly true in a pulp and paper mill because of the diversified operations and the large quantities of various raw materials that must be processed. Too often raw materials are checked carefully when received but rather loosely reported when used. In cost work, the necessity for reporting usages accurately cannot be stressed too much.

Inventories of raw materials should not be difficult to obtain periodically if a reasonable amount of care is taken in checking receipts and reporting usages; the more time and labor expended in perfecting an infallible system and checking to see that it is properly used, the more accurate will be the results and fewer the inventory adjustments which are always very disturbing.

Raw materials received in bulk should be weighed or measured into bins of known capacity and at inventory time it will be necessary to calculate only the contents of the bin in use. No difficulty should be encountered with raw materials received in bags, barrels or drums, etc., if they are conveniently located so that a correct count can be taken.

The stores department is the same in any industry. It carefully checks receipts of all material and takes proper care in issuing supplies on duly authorized requisitions which should be accounted for systematically. This establishes a *Perpetual Inventory* which requires only minor adjustments at the close of the fiscal year.

It is the processed materials upon which most of the work is involved in obtaining accurate inventories because the raw materials often lose their identity completely and are subject to moisture and chemical losses only uncovered by chemical tests. The accountant must refer to the chemist for adequate checks on many of these inventories.

Assume the need to perfect an inventory system for a large and so-called self-contained paper mill, one which makes its own pulps and pulp bleaching agent as well as paper. A mill with such diversified operations would offer an excellent opportunity to understand the various steps necessary to obtain an inventory by presenting a complete picture of all the essential processes required in the manufacture of paper.

The wood mill generally receives the pulpwood in standard four-foot lengths. This wood is put through the chippers directly or piled in the yard. In either case, it must be scaled accurately; first, to know the exact number of cords being chipped; secondly, to determine the quantity of pulpwood on hand. The wood subsequently taken from the piles should be scaled again when sent to the wood mill. Known quantities of the wood are used for each digester charge, and the inventory on hand at the end of the accounting period is represented by the cubical contents of conveniently sized chip bins and quantities of chips in the uncooked digesters as reported by the engineers in cords. Thus the inventory on hand at the first of the period plus the number of cords charged, less the inventory at the close, determines the number of cords cooked, which should check with the usages after making proper allowance for wood mill waste.

In the electrolytic bleach plant, caustic soda and chlorine are manufactured from common salt, the caustic being used in the manufacture of pulp or sold commercially, and the chlorine in the form of gas being mixed with slaked lime to make bleach liquor which is delivered to the pulp bleaching department. The quantity of salt in each electrolytic cell remains constant. So the inventory of salt can be determined readily by the number of cells in operation. Generally, the inventories of salt and lime are constant, but the salt is charged in part on a chemically predetermined percentage to *Caustic in Process*. The remainder of the salt plus the quantity of lime is charged to *Bleach in Process*. The inventory of *Caustic in Process* is represented by the same percentage figure for salt on hand at the end of the period plus the cubical contents of the caustic storage tanks while the *Bleach in Process* inventory is represented by the remainder of the salt, the lime, and the bleach liquor available for delivery from storage tanks.

To *Pulp in Process* is charged the wood chips, cooking liquor or acid and bleach, and this account is credited with the quantities of pulp delivered to the paper mill or pulp machines. The inventory on hand at the end of the period is calculated from the quantities of pulp in slush form in storage tanks or bleach tubs, on which is applied the air-dry test to determine the quantity of air-dry pulp on hand. When pulp is run over pulp drying machines, *Pulp in Process* is charged with the air-dry weights of pulp delivered by the pulp mills and is credited with the air-dry quantities delivered to the paper mill or shipped and with the inventories at the close of the period supported by the air-dry pulp contents of the pulp on hand.

All of the ingredients mixed in the beaters to furnish the stuff for the paper machines are charged to *Beater Stock in Process* such as pulp, clay, size and the numerous other materials requiring no processing plus the broke weighed and delivered to the beater room from the machine rooms and other finishing departments. This account is credited with the predetermined costs of each individual beater furnish as required by the various grades of paper manufactured. The inventory at the end of the accounting period should represent the value of the beater contents and the stuff contained in the beater and machine chests. Some variance necessarily must be introduced due to the impossibility of evaluating with any degree of exactness the contents of the beaters and chests, but the greater the care in predetermining the furnish costs and calculating the quantities of the stuff on hand, the smaller will be the adjustment.

When the paper is weighed off the dry end of the paper machines, it becomes *Rough Paper in Process* and should be identified with individual order numbers until it becomes *Finished Paper on Hand*. *Rough Paper in Process* is charged with the furnish costs and the charges for time spent on all operations necessary, and is credited with the paper finished plus the broke weighed out from the various finishing operations, calenders, cutters, rewinders and trimmers, etc.

The inventory of rough paper involves the most work of all because it is necessary to include not only the paper in the rough paper stock room, but the weights of paper on each individual order at the various finishing operations in order to determine accurately the value of the paper on hand at the various stages from the individual order costs. Costs are maintained on each separate order and include the cost of the stock furnish as predetermined for each grade, machine time, calender time and the burden for every other operation necessary. The total, after an allowance for broke sent to the beaters, represents the cost of the order.

In valuing this inventory, considerable difficulty arises when the order is only partly finished at the end of the accounting period and it becomes necessary to calculate the value of the paper up to the particular stage it has reached at the time the inventory is taken. For example, on an order for supercalendered sheets, part of the paper may be found at the calenders, some at the cutters and the remainder in the finishing room so that the cost of the quantity on hand at each operation must be determined accurately in order to arrive at the value of the *Rough Paper in Process*.

The inventory of *Finished Paper on Hand* is a perpetual one and if the quantities and values are recorded accurately when sent to the storage room and reported correctly when delivered or shipped, no difficulty should be encountered in tying up the physical inventory with the book inventory.

In conclusion, the necessity of properly recording receipts of all materials and accurately reporting their usages should be emphasized again, because inaccurate inventories are a serious detriment in cost accounting.

(*) This article is a correlation of the ideas of several members of the accounting department of an eastern paper mill organization.—*Editor.*

Stroboscopic Light

in the Paper Mill

H. E. MOFFETTE

TO HAVE full technical control of all paper mill machinery and the pulp and paper in process of conversion, it is necessary to know exactly what is happening. So far as chemical reaction is concerned, one technology has been developed, although more often than not even this is in the nature of a post mortem. But as regards the dynamics of the paper industry or any other high-speed industrial process, any real control requires intimate observation. Here is where the stroboscope enters the picture. For the first time, it gives to industry a means of observing high-speed motion; to see what is happening rather than just what has happened. In short, it enables the user to stop high-speed action visually, and to see exactly what is going on, just as if the object under examination were standing still. The author observed a good laboratory demonstration of this, in which a piece of newspaper was pasted on a disc and rotated on a motor-driven shaft at 1800 r.p.m. Then the stroboscopic light was turned on and as soon as it was synchronized with the disc, which can be done readily, the action was completely stopped in so far as vision was concerned, and it was possible to read the finest print on the newspaper easily, in spite of the terrific speed at which it really was moving.

Generally speaking, the stroboscope is any sort of an apparatus which interrupts vision at rapidly recurring intervals. The stroboscopic light with which this article is concerned is a modern refinement of an old principle now made available for industrial research. It is a mercury vapor lamp flashing for 1/200,000 of a second at high frequencies which are under perfect control of the operator. The flashes are so rapid that to the naked eye the lamp appears to be burning steadily, although there is actually a period of absolute darkness between flashes. By means of this lamp, any high speed recurring mechanical motion can be slowed down, stopped, or reversed, at will. For instance, if one wished to observe the action of a bearing in a journal, rotating at high speed in a clock-wise direction, the lamp should be turned on and the frequency gradually increased. The bearing would appear to move slower and slower, and its behavior could be observed intimately with no other mechanical aid whatsoever. If the frequency of the lamp were increased to a point where it was perfectly synchronized with the bearing, the latter would appear to stand still. Any increase in frequency beyond that point would make it appear that the bearing was actually turning in an anti-clockwise direction. This, of course, is due to the fact that the bearing could be seen only when the lamp was on. If one or more complete revolutions occurred between each flash, it would always be seen in the same relative position and it would appear to stand still. If slightly more than a complete revolution occurred between flashes, the bearing would appear to be turning slowly, and if slightly less than a complete revolution occurred, the bearing would seem to be turning backwards or anti-clockwise. It is the same illusion as that obtained by viewing carriage wheels through a picket fence.

The stroboscopic lamp, as described herein is widely used today in the textile industry. With the aid of this lamp, the slightest kink in the thread can be seen on a spindle rotating at 15,000 r.p.m. This permits higher speeds and at the same time insures better quality, whereas formerly the two were not compatible. The lamp also is used in the publishing field, particularly on high-speed news presses. It could be used in the paper industry for studying the action of all sorts of machinery, and parts of machinery such as bearings, journals, springs, fans, turbines, motors and jordans and in discovering and eliminating needless vibrations.

While stroboscopic light alone is all that is necessary to stop high-speed motion of a recurring nature, something else is needed to study any continuous process, such as papermaking, where a particular motion happens just once. This "something else" is available today in the form of the stroboscopic motion picture camera with a microscope attachment. This apparatus is just the practical adaptation of well known phenomena to serve a particular end. It is one of those simple things that any one *might* have thought of, but one man not only *did* think of, but labored two years to bring to virtual perfection. As everyone knows, the ordinary moving picture camera has a shutter which opens and exposes one frame at a time. The shutter closes and the film advances one frame, stops, is exposed and so on. About 20 frames are exposed per second, and they are projected at about the same speed. The stroboscopic motion picture camera, on the other hand, has no shutter and the film travels continuously with no stops whatever. The stroboscopic lamp provides the illumination and takes the place of a shutter, an exposure being made at each flash, and the high frequency of these flashes permits exposures at the rate of 2,000 per second. These can be slowed down in projection to about 15 or 20 a second permitting a slow motion study of minute and rapid industrial phenomena.

In view of the varied and complex specifications which have to be met today and considering the high cost of trial runs, serious consideration should now be given to the fact that the movement of paper fibers in the making actually can be observed. From the time the fibers leave the slice until they are definitely fixed in the ranks, they lead a brief and exciting existence. They are the prey of a complex combination of forces, and yet though Henry and Sealy Fourdrinier have been gone these many years, little has been added to their knowledge of the intimate dynamics of papermaking. The paper is made on the wire. The behavior of stock on a fourdrinier wire is influenced by the nature of the stock inlet, the speed and pitch of the wire, and the force, direction, extent and frequency of the shake. All of these factors can be controlled by the papermaker. There are other less obvious influences at work, such as the force of gravity, centrifugal force, momentum and capillary attraction. These, too, can be modified either by the above mentioned factors, or by the mesh of the wire. Through the eye of the stroboscopic slow motion picture, the paper fibers can be seen floating along on the wire, their reaction to the various forces at work studied, and finally they can be seen to settle into their places in the final sheet pattern. It does not take much imagination to perceive the remarkable possibilities of this device in the hands of the papermaker. Armed with exact knowledge of the behavior of the paper stock under certain conditions, and controlling as he does such a number and variety of forces, it is fair to assume that the papermaker of the near future will be able to produce any desired sheet pattern at will, and that "rule of thumb" and "trial and error" techniques will be dead as the dodo.

The author has seen various laboratory demonstrations of the extraordinary phenomena observable in stroboscopic light, observed the first reel of stroboscopic slow motion pictures ever taken, and talked briefly with the inventor of the apparatus. He hazards the opinion that when the possibilities of stroboscopic light are better known to the paper industry, the concept of what actually occurs on the paper machine and in paper mill machinery in general, will be profoundly altered.

◆ ◆

◆ N. W. PICKERING, president of Farrel-Birmingham Company, Inc., Ansonia, Conn., and Buffalo, N. Y., sailed on the Britannic on April 8 for a two months' trip which will take him to a number of countries of Europe. The trip is one combining business with vacation and Mr. Pickering will spend some time with the company's representatives in England, France, Sweden and Norway. He also will visit Germany and Italy. Mrs. Pickering accompanied her husband to England.

Heavy Sheet-Forming Machine

A NEW forming machine for wall board, insulating board and heavy sheets has been patented by the Downingtown Manufacturing Co., Downingtown, Pa. This is a complete unit comprised of a pressure forming chamber, a primary press section and main presses. The detailed design of the various units is modified to suit individual requirements.

Description

The forming chamber is an enclosed space, the side walls of which are especially designed to contain the stock and to permit the free passage of the traveling wire which constitutes the floor of the chamber. This wire is supported by table rolls which are mounted in antifriction bearings. The top of the forming chamber slopes from the inlet to the outlet; the discharge section of the top being pivoted to allow vertical movement.

The top primary presses are carried in arms which are pivoted on the movable section of the forming chamber, thus these parts automatically "breathe" or accommodate themselves to the thickness of the sheet produced. Regardless of the thickness of the sheet, a constant, predetermined pressure is maintained on the board by hydraulic cylinders, which are operated in conjunction with accumulators. This flexible coordination of the forming and primary press sections permits the manufacture of a wide range of board thicknesses, without making any mechanical change in the machine itself.

The main press section consists of two or more sets of rolls, the exact number depending on the characteristics of the material handled by the machine.

The arrangement and travel of wires and felts varies depending on the kind of raw material used and the finish desired. In the illustration shown, the bottom or forming wire travels from the bottom breast roll through the forming chamber, the primary presses and the main presses but it may be arranged to return after the last primary and another bottom wire or felt used through the main presses. The top wire enters the forming chamber at the leading edge of the top pivoted section of the forming chamber and returns after the last primary. A second top wire or felt is used in the main presses but, if desired, one top wire can be used continuing from the top breast roll in the pivoted top section of the forming chamber, through the primary and main presses and then returning. The adaptability of the machine to various conditions and requirements is thus evident for it may be clothed with two wires, two wires and one felt, two wires and two felts or four wires.

Operation

The stock is pumped from the storage chest to a carefully designed proportioning head box, in which a consistency regulator may be mounted, if desired. The stock then flows into a mixing chamber, where it is diluted with white water, from the white water head box and it then passes into the forming chamber. Water rapidly flows through the bare wire as it enters the forming chamber, depositing a mat of fiber on the bottom wire. Water is continuously drained through the mat and wire as it passes through the forming chamber, and more fibers are gradually deposited at a reduced rate, until the first primary press rolls are reached. As the newly formed sheet approaches the outlet of the forming chamber, it comes in contact with the top wire and is gradually compressed between the two wires as it approaches the nip rolls, or first pair of primary presses. A large volume of water is expelled from the sheet as it passes through this pivoted top outlet section and a special opening is provided in the top plates to permit its removal without disturbing the original formation of the sheet. As the sheet travels through the primary presses, between the two wires, the added pressure of each roll is very slight, thus removing the water from the sheet without subjecting it to any disturbing influences. After the last primary, the sheet passes into the main press section, along with wires or felts, as described in the preceding paragraph.

Advantages

Formation takes place in large unrestricted space allowing the fibers to settle down undisturbed.

The force of gravity always assists in the formation. Any tendency for the stock to settle helps rather than interferes with the formation.

Formation takes place under uniform hydrostatic pressure in the entire forming chamber.

This type of machine will handle very free stock and an abundance of water.

Due to large free forming space, long fibers form excellently.

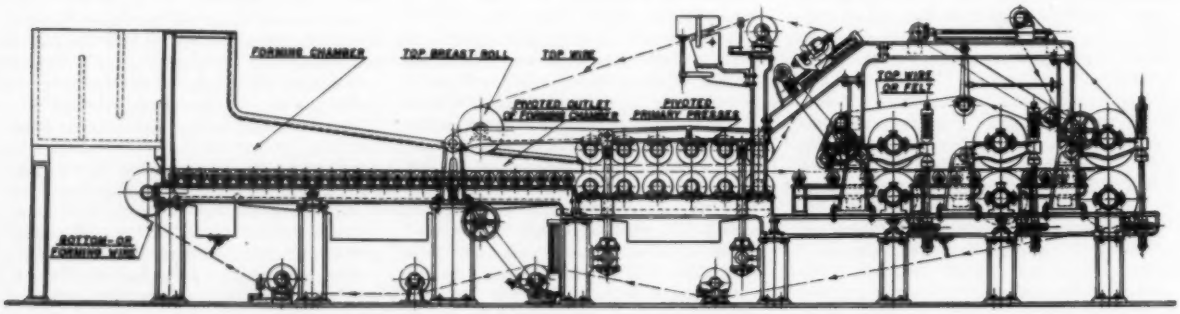
The machine not only handles long free fiber but also short slow fiber; in fact, it will handle any fiber that will form a board and make the best board that can be produced from the given fiber.

Formation takes place in a straight line and the sheet is not bent or disturbed from the time formation begins until the final pressure is completed.

No auxiliaries are required.

Power requirements are very small. An eight-feet wide machine will absorb approximately seven to eight horse power.

The wires are easily cleaned without diluting white water or stock. The long runs outside of the forming chamber provide ample time and space to thoroughly clean the wire where there is any tendency for the stock to adhere and the shower water does not flow into the white water chamber, thus preventing any undesirable dilution.



The thickness of the board produced is limited only by the quality of the stock. The company's laboratory machine has produced board from .080 inch to 1¾ inches in thickness.

Laboratory

Various raw materials and requirements demand individual specifications for various sections of the Downingtown Board Forming Machine, therefore, the Downingtown Manufacturing Company has built a laboratory machine having a full commercial length forming chamber, six primary presses and four main presses using a 28-inch wire of approximately commercial length. This machine is installed in a laboratory equipped with complete board manufacturing equipment, including rotary digesters, pulpers, screens, washers and a 50-foot dryer, together with the chests, pumps and testing apparatus to produce dried and trimmed board under full control.

Remedies for Knocking in Steam Engines

R. H. Bacon

THE principal cause of pounding in engine bearings is lack of adjustment to compensate for wear. No matter how profuse lubrication may be, wear naturally occurs and adjustment must be made from time to time. On the other hand, one should not be continually tinkering with the engine bearings, as some engineers are prone to do, for bad results will surely follow.

If an engine is properly erected, the shaft will be square with the center line of the engine, and if the bearings are properly adjusted, the engine should operate quietly.

As the main bearing wears, adjustment is made from time to time, which naturally crowds the shaft towards the cylinder, but as the outboard bearing cannot be adjusted to compensate for the wear in the main bearing, the shaft will soon get out of square. With an engine of this design, the shaft should be squared up and shims added behind the rear quarter box so as to hold the shaft in the same position as it was when erected.

Should the engine be belted forward, the wear on the outboard bearing will be in the same direction, continually, while the rear quarter box of the main bearing will have its usual wear, owing to the intermittent thrust of the piston. This arrangement soon throws the engine out considerably with consequent pounding.

When the shaft is out of square, the crankpin and crosshead-pin boxes will slap from side to side, causing noise, and a continuance of this operation will cause the brasses to wear in the rod ends and even after the shaft has been squared up, these boxes will continue to pound unless shimmed up. Shimming strips may be sweated onto these boxes, or if the wear is so small that very thin shims must be used, plane off 1/8 or 1/16 in. less the wear and sweat on a piece of brass this thickness and scrape the brass to a perfect fit.

Of late years, engine builders have given more attention to engine adjustment and the main and outboard bearings are usually provided with adjustment both ways from the squared center line of the shaft. Sometimes either the main or outboard bearing, or both, is provided with a bottom wedge adjustment in order to keep the shaft level.

A cause for pounding little understood and, in fact, ignored by many engineers, is loose babbit. How frequently we see bearing shells which have been melted out for rebabbiting, where the anchor holes are but an ordinary hole drilled in depth not more than the diameter of the hole.

Such a method cannot be criticised too severely. If for any reason anchor holes or slots are not cast in the shell, and it is necessary to drill them, the holes should be generous in diameter and depth, if the stock will stand it.

Let us suppose an instance where the shaft is, say, 12 in. in diameter, and that the slot cores "fell out" when casting, leaving the shell wholly or partially devoid of any method of holding the babbit. Anchor holes should be at least 3/4 in. in diameter and fully as deep, and at the bottom, holes about 5/8 in. should be drilled at an angle so as to form a "root" to the babbit.

These large holes should be spaced not more than 2 in. apart (less would be better), and should be slightly countersunk at the top, for if a sharp edge is left, the anchor may easily break off in operation.

Another cause, or, rather, presumed cause, of pounding in engine bearings, is a noise having its origin in another place, but which seems to be in the crankpin or main bearing. It occasionally happens that a crosshead shoe will become loose, especially if it be of the non-adjustable kind. By this is meant that type of shoe which is bolted directly to the crosshead itself, shims being inserted from time to time as required. To do this, it is necessary to remove the connecting rod and rotate the crosshead until the shoe comes out at the side of the bore, where it can be removed and shims inserted.

If the retaining screws become loose in operation, the shoe is not gripped tightly and the continued reversal of motion soon causes a little lost motion, which grows rapidly. If allowed to become too bad, machine off where wear has occurred and rivet on a steel shim, afterwards fitting the parts snugly and renewing the bolts attaching shoe to crosshead, using a size necessary to make a good job of it.

Lateral motion of the shaft is one cause of an annoying pound in the main bearings of engines. It is necessary to have at least some play here, but occasionally it is too much. Sometimes a wobbling wheel will cause lateral motion, or a wide band wheel which, though it may balance perfectly, could it be tested on gigantic balancing rolls, might be heavier on one side of the rim than the other, this defect in the two halves of the wheel being on opposite sides of the rim.

If the engine is direct connected to a generator, it is possible to have the stator so perfectly set that the rotor moves in practically a neutral path and no magnetic influence is present to hold the shaft steady either against the crank or the collar. The remedy in a case like this is to move the stator laterally, preferably away from the main bearing, a small amount, in which case the magnetic influence will hold the crank constantly against the bearing.

If the shaft be moved too far, the thrust of the crank against the bearing will be so great as to cause heating.

◆ Fighting Bitumen Fires

Although asphalt, pitch, and tar do not offer a severe fire hazard at ordinary temperatures, when they burn they burn persistently. They create a tenacious fire that merely spreads and intensifies in the presence of water—and that usually yields only to a suffocating blanket.

If direct fire heat is applied to kettles or vats in roofing operations or in the manufacture of roofing materials a hazard is created by the possibility of a boil-over, or of the kettles cracking and distributing their contents. A serious hazard also exists when these substances are used to coat paper or "felt" in the manufacture of roofing materials. The impregnated paper, draped in festoons in the drying rooms, offers the possibility of a very stubborn fire.

Water or wet chemical extinguishers are not recommended and should not be used on pitch fires. Although they may check surface fires where the flaming material is very thin, most fires of this nature involve a depth of hot liquid which these extinguishers cannot handle, and in contact with which they are actually more likely to spread the fire.

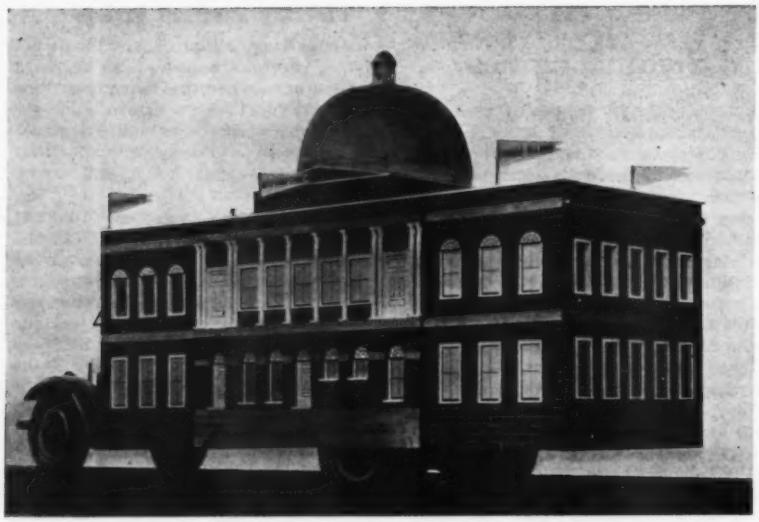
Carbon dioxide equipment or vaporizing liquid fire extinguishers may be used effectively in some cases, but they can be recommended only where the extent of the specific hazard can be definitely determined.

Of all of the various types of fire extinguishing equipment, the best available for this special hazard is the foam type. The foam, forming an air-tight fire-resistive blanket, flows over the burning pitch, which cuts off the supply of oxygen and quickly smothers the fire. And since the volume of water for each gallon of foam is relatively small no harmful excess of water is present if the foam stream is instantly shut off when the fire is extinguished.

When fire occurs in a kettle or vat, the foam stream should be directed against the inside edge of the kettle, above the level of the burning material, so that the force of the stream is broken and the foam is permitted to spread gently over the blazing surface. When the kettle is full, the foam stream should be directed from a distance, permitting the foam to fall as lightly as possible on the surface. The foam stream should *never* be directed down into the blazing liquid—it then acts as an agitator, increases the chances of boiling over and loses its opportunity to spread over the surface.

On spill surface fires, the foam stream should be directed at the base of the flames, covering the fire progressively from the nearest to the farthest point so that the foam will blanket the blazing material as quickly as possible.—(From *Firefax*, No. 5.)

◆ THE 15TH EXPOSITION of Chemical Industries will be held at Grand Central Palace, New York City, December 2-7, 1935. From the amount of space already reserved, the 1935 exposition will be one of the largest to be held in recent years.



◆ State House Replica Made by Bird & Son

The accompanying illustration shows a replica of the Massachusetts State House mounted on a truck which will carry it on a tour of the East, the South and the Middle West. Here is a unique idea in publicity—a State House model that carries the invitation to "Come to New England in 1935."

This unusual replica was constructed under the direction of the Sales Promotion Department of Bird & Son, Inc., East Walpole, Mass. It is made entirely of Bird products and stands 15 feet 6 inches high; is 20 feet long and 9 feet wide. The roof is of Prosiate Roofing, and the side-walls of the realistic Art-Bric Siding. Similating the granite blocks of the original building, Paroid roofing is wrapped around the battens at the base of the building, and in the interior and the framework, Bird Building Board, Wallboard, Duracork, Lining Felt, and Plastic Cement have been used.

On the truck is a fine loud speaker over which musical records and records of speeches can be played while people are inspecting the model. The records include messages of greeting and invitations from all the New England governors, and one five-minute record tells about Bird & Son's plants and products. The name of Bird & Son is also displayed on the side of the replica.

The truck is accompanied by a representative of the Gray Lines of the Boston Sightseeing Tours.

◆ Victor Mill Acquires Lawrence Machine & Pump

Mr. Victor J. Mill of Baldwinsville, N. Y., has purchased the Lawrence Machine & Pump Co., of Lawrence, Mass., and will continue to operate it under the name of the Lawrence Machine & Pump Corp. This company, which was established in 1882, made the first centrifugal pump in the United States, and was for many years a leader in its field and, at its peak, shipped between 1000 and 1500 pumps annually to all parts of the world.

Mr. Mill, who has been prominent in the industry for nearly 20 years, plans to continue the "Lawrence" line of pumps with many new improvements in design. The line will include centrifugal pumps, for a broad and varied field, notably single and multi-stage water pumps, stock pumps, sewerage and sludge pumps, slurry pumps, chemical pumps and sand and dredging pumps.

In addition, the plant will build hydraulic dredges and special machinery, a field in which Mr. Mill has had a wide experience. The plant is well equipped for this latter type of work.

Mr. Mill is a graduate of the Sheffield Scientific School of Yale University. His practical experience covers a four-year shop training course with the General Electric Co. at Schenectady, N. Y., two years as field engineer on hydraulic construction with Jas. Stewart and Co., a year as field engineer on general construction with the Standard Oil Co. of New Jersey, and nineteen years with the Morris Machine Works of Baldwinsville, N. Y., the last eight years of which he served in charge of engineering and sales and as a director. The new proprietor of the Lawrence Machine & Pump Company has had extensive experience in the design, testing, installation and sale of pumping machinery and hydraulic dredging plants of all kinds in this country, Canada, Mexico, Central America and Europe.

Mr. Mill is a well known writer on subjects pertaining to pumps and hydraulic dredges. His articles have appeared in the Engineering News Record, Rock Products, Pit & Quarry, and other publications. He holds three United States Patents covering improvements in centrifugal pumps. His affiliations include the American Society of Civil Engineers, The Technology Club of Syracuse and others.

◆ George R. Wyman

George Russell Wyman, vice president of Bird & Son, Inc., East Walpole, Mass., passed away suddenly at his home April 5, at the age of 68 years.

Mr. Wyman had been associated with Bird & Son for 48 years in the manufacturing end of the business. For many years he was superintendent of the Box Shops; later assuming managerial duties. In 1915 he became general manufacturing manager in charge of all manufacturing in the company's plants in this country and Canada. In 1927, he was elected vice president in charge of manufacturing. In August, 1933, he relinquished his more active duties and remained as advisory and consulting vice president until the time of his passing.

Mr. Wyman was a member of the Technical Association of the Pulp and Paper Industry; he was a member of the T.A.P.P.I. committee on Mill Waste, and a member of the American Management Association. He was an inventor and engineer and obtained many patents on machinery and products during the past 50 years.

The widow, two daughters and a son survive.

◆ T.A.P.P.I. Fall Meeting Headquarters Selected

Following a meeting of the Entertainment Committee of the Fall Meeting Committee of the Technical Association of the Pulp and Paper Industry on April 28, at Atlantic City, N. J., the Ambassador Hotel of that famous convention town was chosen as headquarters.

The meeting is to be held on September 18 to 21, 1935, and because a record attendance is expected a large hotel was in order. The meeting facilities at the Ambassador are of outstanding merit and its location will contribute much to the success of the meeting.

The Committee was very fortunate in securing favorable rates in a hotel that is able to attract capacity crowds at relatively high normal rates. For the benefit of T.A.P.P.I. members and others who may attend the meeting these rates for single rooms will be $3 to $5 and for double rooms they will range from $5 to $7, the higher priced rooms being those that will command an unobstructed ocean and beach view.

Reservations must be made directly with the Ambassador Hotel, Atlantic City, N. J., and since the best assignments will be made in the order received, it will be advantageous to reserve rooms as soon as possible. The number of rooms carrying the minimum rate is limited and there will probably be none available after June 1st. It is therefore advisable to send in reservations right away to avoid disappointment later.

Because of the location of the meeting place and the low rates the convention offers attractive advantages to those who may wish to attend during their vacations. By special arrangement these rates will apply for several days both before and after the meeting. The

bathing facilities at the hotel are excellent. No rent will be charged for lockers and there is a large salt water swimming pool in the hotel for those who may not wish to use the beach.

Many members are planning to take their families along and for this reason an unsually fine program for the ladies is being developed by Mrs. H. P. Cannon and her enthusiastic co-workers. Mrs. Cannon recently visited the Ambassador and was very favorably impressed with the accommodations provided for bridge parties and other activities. It is doubtful if anyone can plan as complete a vacation as will be provided by T.A.P.P.I. in September. Anyone interested may attend and early reservations are urged for those who wish to get the most benefit from the convention.

◆ Dr. Chipman With Armco

Dr. John Chipman has joined the research staff of The American Rolling Mill Company as associate director of the Research Laboratories. He will be responsible for research activities in the field of melting and refining metals. For six years he was research engineer in the Department of Engineering Research at the University of Michigan.

Dr. Chipman was the recipient of the Howe Medal of the American Society for Metals in 1934, being awarded this distinction for his paper on "The Application of Thermodynamics to the Deoxidation of Liquid Steel." He was graduated from Sewanee in 1920 and received his M. S. degree at the University of Iowa in 1922 and his Ph. D. degree at the University of California in 1926. For two years he taught physical chemistry at Illinois Weslyan and for three years taught the same subject at Georgia Tech.

For several months he has been devoting part time to Armco's research laboratories, but will now give all his time to his new responsibilities.

◆ Fox River Valley and Lake Shore Safety Meeting

The Eighth Annual meeting of the Fox River Valley and Lake Shore Safety Conference will be held at Sheboygan, Wis., May 22. The forenoon will be devoted to a General Session. In the afternoon the various Sections will hold separate meetings with an Evening Dinner Meeting at six o'clock.

The Paper and Pulp Section will convene at 1:30 p. m. in the council room of the City Hall. F. F. Martin, of Kimberly-Clark Corp., Neenah will conduct the meeting as chairman. H. D. Banta, of Hoberg Paper & Fibre Co., Green Bay will act as co-chairman. Safety Provisions of the Pulp and Paper Code will be discussed by J. J. Pizak, of the Consolidated Water Power and Paper Co., Wisconsin Rapids. Progress in solving some of the Industry's common safety problems will be the subject of an address to be given by J. A. Limpert, superintendent, paper and pulp department, Kimberly Mill, Kimberly-Clark Corp., Kimberly, Wis.

◆ Stebbins Developing New Lining Material

It is understood that the Stebbins Engineering and Manufacturing Company has for some time past been developing a waste sulphite liquor recovery process and a new type of lining which is expected to create considerable interest. No details have as yet been divulged.

A. F. Richter, for many years president of the Stebbins firm, has resigned as president of that organization, in order to devote his entire time to research and development of new lining materials and processes, in behalf of the company.

◆ J. E. Holveck Joins Worthington

Worthington Pump and Machinery Corporation announces the appointment of J. E. Holveck as special sales engineer, operating from its Pittsburgh office but extending his activities also to the territories of the Cleveland, Detroit, Chicago and Buffalo offices.

Mr. Holveck was formerly a member of the engineering staff of Worthington's Holyoke Works and later was associated with The Aldrich Pump Company as sales engineer in its Pittsburgh and middle west districts.

He has been responsible for many developments in pumping equipment and hydraulic accessories, principally associated with high pressure applications. These have been utilized mainly in industries requiring hydraulic power as a medium of production in steel, other metals, and plastic materials, and include also high pressure boiler feeding and oil industry applications.

◆ Spring Meeting of NW Division Superintendents

The annual spring meeting of the Northwestern Division of the American Pulp and Paper Mill Superintendents Association will be held at Marinette, Wis., Saturday, May 18.

In addition to the business sessions, visitors will be taken through mills in the vicinity, and provided with plenty of amusements and entertainment. An innovation of this year's meeting is that an invitation has been extended to mill managers to attend the meeting with their superintendents.

◆ Chemical Industry Medal Award

The American Section of the Society of Chemical Industry announces that the award of the Chemical Industry Medal for 1935 has been made to Dr. Edward R. Weidlein, Director of the Mellon Institute of Research at Pittsburgh, Pa. This award is made annually to a person who has made a valuable application of chemical research to industry, primary consideration being given to applications in the public interest.

Presentation of the Medal will be made at a meeting of the Society of Chemical Industry in the fall.

◆ C. F. Cross, F. R. S.

C. F. Cross, F. R. S., well known as a pioneer in the development of cellulose research, passed away at his home in Hove, England, April 15, at the age of 80 years.

The following facts concerning the life and work of Mr. Cross are taken from an extensive obituary published in the April 19 issue of *The World's Paper Trade Review.*

Mr. Cross was born in 1855 at Brentford, Middlesex. He was educated at King's College, London, Zürich University and Polytechnickum and Owen's College, Manchester. After graduating at the London University (B. Sc.), he entered on research on the constitution of the jute fiber substance and technical developments at Barrow-in-Furness, 1879-81, then being engaged with the Barrow Flax and Jute Co. In collaboration with the late Mr. E. J. Bevan, who passed away in 1921, he continued and extended this work at the Jodreil Laboratory, Kew, subsequently founding the partnership of Cross and Bevan, research and consulting chemists, in 1885.

Mr. Cross's work in connection with cellulose is a long and elaborate story. In 1892 he discovered and patented with Mr. Bevan and the late Mr. Clayton Beadle, the viscose process of treating cellulose which made possible the manufacture of artificial silk, and the industrial developments of the process were launched through proprietary companies formed for the purpose in 1893 to 1900.

For his research work, Mr. Cross received many distinctions. In 1916, he was awarded the medal of the Society of Chemical Industry "for conspicuous services to chemical industry." In 1917, he was elected a Fellow of the Royal Society, and was president for two years of the Society of Dyers and Colourists. He was selected as Research Medalist of the Worshipful Company of Dyers.

Mr. Cross made extensive contributions to the literature of research chemistry. In association with Mr. Bevan he published textbooks on "Cellulose and Researches on Cellulose" and on "Paper Making," which went into several editions. His contributions to scientific journals also were comprehensive and a record of them really comprises much of the pioneer development of research in cellulose.

It was in recognition of his invaluable work that Mr. Cross was elected the first honorable member of the Technical Section of the Paper Makers' Association at the initial General Conference of the Section held in Manchester in October, 1920.

◆ WILLIAM A. VAIL, president of the Vail Rubber Works, St. Joseph, Mich., passed away suddenly April 11 at his home in St. Joseph. Mr. Vail was 75 years old and has been actively engaged in the rubber roll covering business for forty years. Surviving him are two daughters.

◆ TURBO-MIXER CORP., New York City, has moved to a more central location. The new address is 247 Park Ave.

◆ Dial Micrometer

Testing Machines, Inc., 450 West 34th Street, New York City, has added a new dial micrometer to their line of instruments. The dial of this micrometer is housed in a stainless steel case and is protected by an unbreakable crystal. Dial graduations are in thousandths of an inch, but the dial can be read without difficulty to one-half that amount. The anvils are opened by turning an

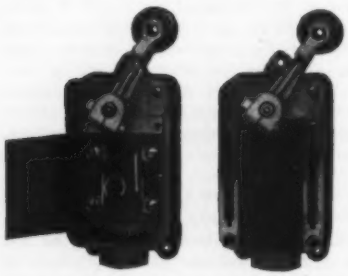
operating wheel, to admit the material to be measured, against the action of a spring. When finger pressure is released from the wheel, the spring brings the anvils together on the material under measurement. Due to the spring action it is claimed that the same reading can be secured for any given dimension by two or more men using the same instrument. The pointer on the dial can be adjusted to zero by turning a locating screw to raise or lower the bottom anvil.

All of the parts of the micrometer, which is light in weight and suitable for carrying in a pocket, are replaceable; and the instrument is guaranteed for accuracy to within one-half thousandth at any point.

◆ Track-Type Limit Switch

A small, track-type, spring-return limit switch, intended for use in making or breaking control or indicating circuits at a fixed point in the travel of a part of a machine or mechanism, has been introduced by the General Electric Company, Schenectady, N. Y. The switch, designated as CR9440-A1A, has one normally open and one normally closed circuit. Its maximum carrying and breaking capacity is 5 amperes at 550 volts a.c. and on d.c. ranges upward from C.4 amperes at 550 volts to 2.0 amperes at 115 volts.

The new device is operated by an 18-degree movement of its operating arm

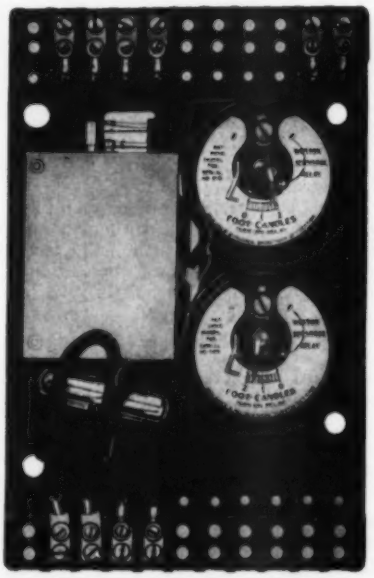


from the normal position, an overtravel of 54 degrees being possible without causing damage to the switch. A precision mechanism on the operating arm affords simple, accurate adjustment of the arm to any position around the operating shaft.

The switch, with the exception of its operating arm, is enclosed in a die-cast box 4 inches high, $2\frac{7}{16}$ inches wide, and $1\frac{29}{32}$ inches deep. At the bottom of the case, a half-inch conduit connection is provided; while a ball-protected oil hole at the front of the operating shaft simplifies lubrication, and a removable aluminum cover provides convenient access to contacts and wiring studs.

◆ Automatic Illumination Control

A new Photronic electric-eye control which turns lights on and off automatically to maintain a predetermined level of adequate illumination has been announced by the Weston Electrical Instrument Company, Newark, N. J. The desired "turn on" and "turn off" illumination values are simply set in advance on two independent scales, and at these values the Photronic cell actuates a relay controlling the light circuit through a mercury switch.



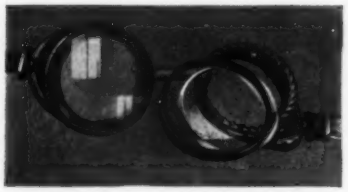
For indoor use, the light collector containing the electric eye is directed at the location where illumination is to be maintained, and the electric impulse it sets up is carried by ordinary leads to the panel containing the relay and switch. Both the light collector and panel are also available in weatherproof housing for outdoor use controlling yard lights, electric signs and the like.

◆ Safety Goggle

A new goggle, designed to give both effective ventilation and protection from splashes of dangerous liquids and the impact of flying particles, has been announced by American Optical Company, Southbridge, Mass.

The eyecups of this new goggle, known as the AO Duralite-50 chemical goggle, are molded to fit snugly to the contour of the face, thus preventing liquid from entering around the goggle. Air circulates through slots in the lens rings, through radial slots in the eyecups and through perforated side shields. A solid baffle plate in back of the side shield is flared out on the edge nearest the lens to permit air circulation but isolating the eyes from splashes.

The goggle is fitted with what is designated as Super Armorplate lenses which are said to provide maximum lens protection from impact.



Exact and comfortable fitting to individual worker is provided through an adjustable rubber-covered ball chain bridge together with an adjustable one-piece headband.

◆ Ball and Roller Bearing Housing Closures

The Bearing Appliance Company, of Ardmore, Pa., is manufacturing a number of cast iron closures including closed covers, open covers with flingers, with felts or for leather oil seals. Fourteen sizes of covers are available and approximately 150 sizes of ball and roller bearings can be fitted in a great variety of design combinations. Many of the parts have lubricant and cleaning openings.

◆ Improved Design of Hydraulic Lift Truck

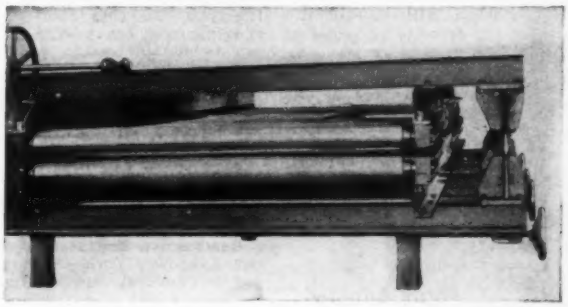
An improved model of the hydraulic lift truck that has been built for the last few years by Lyon Iron Works, Greene, N. Y., has been announced by them. The improved design of truck is made in standard capacities of 3500, 5000, and 6000 lb. in both narrow and wide models. Angle iron instead of channel or flat bar iron is used for the frame to increase rigidity and strength, and to give wider bearing surface for a skid platform. Axles are of heat treated alloy steel. Alemite lubrication is provided in the wheels and other essential parts. Timken roller bearings are used

in the front wheels to take side thrust when turning and to make steering easier as well as to lessen the wear on the wheels. With a standard lift of 3 inches on all models, only 3 complete strokes are said to be required to obtain this lift with the 3500-lb. model, 4 strokes with the 5000-lb. model, and 5 strokes with the 6000-lb. model.

◆ Two Direction Creping Machine

A creping machine to narrow the paper web and to put in crinkles in a longitudinal direction either before or after wet or dry transverse creping, thus permitting stretch of the creped paper in all directions, has been announced by the Cannard Co., Green Bay, Wis.

This machine can be made in various



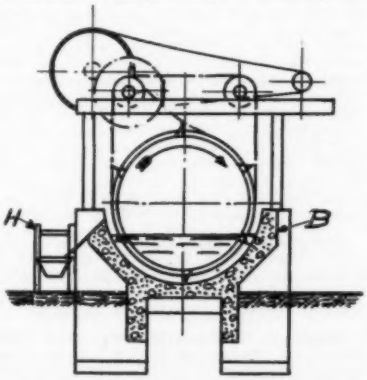
sizes from 12 in. wide for use in conjunction with small paper converting machinery up to any width for adaptation to paper making machines. A unit designed for use in connection with embossing machinery is said to eliminate to a very marked degree the destruction of fibres during the embossing process. By passing the paper through the creping machine prior to entering the embossing rolls, it can be narrowed to any required degree, thus providing a surplus of paper to be taken up by the design in the embossing rolls. Consequently, it is suggested that an embossed sheet produced in this manner will retain very nearly its original strength which adds to a better and more prominent design.

The machine is stated to be well adapted for the creping of bag and barrel liners, floral and decorative papers, paper table napkins, toilets, towels, facial tissues, corrugated boards, packing and wrapping papers as well as numerous other specialties. By varying the design and size of machine it is suggested that creped paper with any degree of cross stretch up to 75 per cent or more can be produced.

The method and apparatus are covered by several U. S. Patents and others are pending.

◆ Continuous Log Barker

A log barker, that is designed to bark logs of varying lengths continuously and that is designated as the continuous Waplan log barker, is a recent addition to the line of pulp and paper mill equipment of Fibre Making Processes, Inc., 8 South Michigan Blvd., Chicago, Ill.,



and for which they have obtained exclusive manufacturing rights throughout the United States, Canada, and Newfoundland.

The barker consists of two or more open end drums of U-bar construction and of equal length but of varying diameters. These drums, suspended in chains and rotated by them, may operate partially submerged or dry, two sections of the installation being driven by one drive shaft.

A special feeding apparatus, operating in connection with a log-haul, holds the logs suspended horizontally until they are almost entirely within the barker. This feeding apparatus consists of a set of live rolls and a feed roll. The feed roll is carried on a hinged arm which permits it automatically to move down when a log approaches and up when the end of the log has passed the roll.

As the drums revolve, the logs tumbling against one another bark themselves, the logs moving forward through the different sections and finally discharging through the open end of the last drum. In case of wet barking, the barked logs would be discharged into a pond from which they are taken by a conveyor; but in dry barking, such as in southern mills, no pond is required at the discharge.

Bark removed from the logs falls between the U-bars of the shells into the vat beneath from which it is discharged by scrapers and then carried away by a conveyor.

◆ Position Transmitter and Recorder

A duplicate position telemeter system for indicating and recording at a distance the position of mechanisms such as gates, valves or water level in water power plants, engine governor positions, or the position of any important mechanism, has been announced by the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.

◆ Dead Fuse Indicator

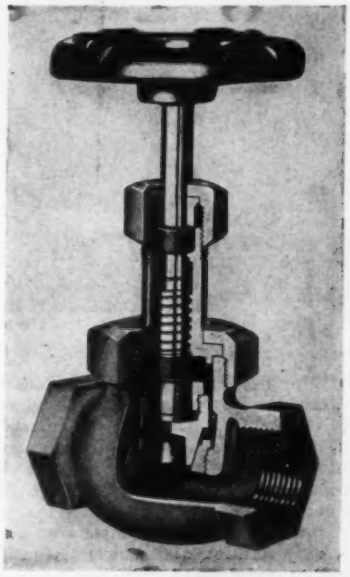
A tiny neon lamp and casing, designed to tell instantly when and where a fuse is blown, has been anounced under the name of Ded-Fuse Tattelite by Littlefuse Laboratories, 4507 Ravenswood Ave., Chicago, Ill.

This device is designed for circuits of 100 to 550 volts A. C. or D. C. and lights on only .0005 ampere current. It is connected directly in parallel with a fusee and draws no current until the fuse has blown. Measuring only 1¾ in. long overall x 5/16 in. maximum diameter and with a 6 in. connecting lead, it is adapted for use on any size cartridge fuse and even on plug fuses. The lamp bulb itself is only 1 in. long.

The Ded-Fuse Tattelite is also suggested for use to indicate open circuits, switches, and relays.

◆ New Plug Type Valve

The Fairbanks Company, New York, N. Y., has announced a new plug type valve which has been designed for service where there is excessive wire drawing or destructive action on the valve seat or disc. In this design of valve it is claimed by the manufacturer to be impossible to concentrate the stream flow on any part of the plug or seat and



produce erosion or wire drawing; and that a long seating surface between the plug and seat insures added life. Both seat and disc are made of special nickel alloy of high Brinnel hardness and can be reground indefinitely without removing the valve from the line. A shoulder on the spindle affords a back seat which permits packing of the stuffing box under pressure when the valve is wide open.

◆ New Pressure Fire Extinguisher

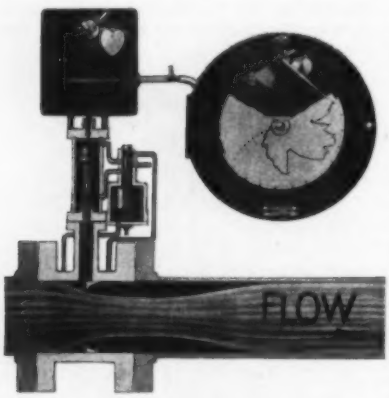
The Pyrene Manufacturing Company, Newark, N. J., has announced a new 2-quart vaporizing liquid fire extinguisher that is discharged by air pres-

sure and which delivers a fan-shaped spray as well as a solid stream. The extinguisher is compact, weighs only 16½ pounds fully charged, and is 18 inches high and 5 inches in diameter. It is operated merely by opening the operating valve on the top of the extinguisher and by controlling the combination discharge nozzle. This extinguisher, constructed throughout of copper and brass, is recommended by the manufacturer for incipient fires in all classes of material and especially for inflammable liquids and electrical fires.

◆ Flow Meter With Varying Orifice

A flow meter, which utilizes a varying orifice, is now being manufactured and marketed by the Elgin Softener Corporation of Elgin, Ill. This flow meter, designated as the Isometer, consists of two parts, namely, an actuator and a meter single or in combination.

The actuator, located in pipe line and consisting of a flanged cylindrical section in the center of which is mounted a set of plates forming a variable orifice, utilizes full line pressure.



With a pressure drop established, it is necessary only to measure the opening of the orifice. The vertical movement of the orifice gate is measured by changing the linear motion of a small stem connected to it to rotary motion. The rotary motion operates an electrical time contact device which consists of a constantly rotating cam that is driven by a clock-type motor.

The electrical impulses from the actuator may be transmitted by a two-wire circuit to any remote location. Power supply for operating the indicating, totalizing, or recording meters may be picked up at any convenient point provided it is from the same power system.

◆ Beltless Napkin Folder

Paper Converting Machine Company, Green Bay, Wis., has announced that a new beltless napkin folder has been designed and manufactured by them. This folder is said to be adapted for quarter and special folds, and, in addition to the elimination of belts, it is stated to be slightly speedier than their regular high-speed folders with belts.

◆ F. W. Thomas with John Waldron Corp.

F. W. Thomas, for the last ten years New York district manager of the coupling division of The Bartlett Hayward Company, has joined the staff of the John Waldron Corporation of New Brunswick, New Jersey, as general manager of sales of the Francke coupling and Silent Gear departments.

As of July 15th the sales staff of John Waldron Corporation will handle the sale of its products directly in place of through Smith and Serrell of Newark, New Jersey, who have functioned as general sales agents heretofore.

◆ THE NEW YORK offices of both the Cleveland Crane and Cleveland Tramrail Divisions of the Cleveland Crane & Engineering Co., are now located at 60 East 42nd Street. The telephone number is Murray Hill 6-2296.

◆ T.A.P.P.I. Standards Adopted

The Standards Committee of the Technical Association of the Pulp and Paper Industry has announced the result of the recent balloting as follows:

T.A.P.P.I. Standard T 407 m—Amount of Coating in Mineral Coated Paper (Adopted).

T 454 m—Acid Soluble Iron in Paper (Adopted).

T 619 m—Analysis of Salt Cake (Adopted with slight modification).

T 620 m—Analysis of Water (To be continued as a Tentative Standard because of controversial details).

T 621 m—Analysis of Rosin (Adopted with slight modification).

A mailing of a large number of T.A.P.P.I. Standards will soon be sent to all members in good standing who have T.A.P.P.I. Manuals. Any member may obtain a binder and full set of standards on written request sent to R. G. Macdonald, Secretary of T.A.P.P.I., 122 E. 42nd Street, New York.

◆ E. H. LARKIN, recently elected a vice president of the Bryant Paper Co., Kalamazoo, Mich., has been appointed general sales manager.

◆ Another Use for Paper

A new product, recently placed on the market for use in both percolators and dripolators, not only filters coffee as clear as your favorite cocktail, but also keeps the grounds together so that they can be easily disposed of. This new filter-liner combination is marketed under the trade name of Perk-O-Liners, by the General Paper Products Company, 234 Boylston Street, Boston, Mass. They are packed thirty in a box to retail for ten cents.

Perk-O-Liners will be distributed through chain grocery, drug and five and ten cent stores, as well as department stores, backed by a national advertising campaign. Patents are already pending, which will give the General Paper Products Company exclusive manufacturing rights to this new and novel idea.

◆ New Catalogues and Publications

Beaver Pipe Tools, Warren, Ohio—A pictorial bulletin is devoted to the Beaver Model-A Portable Pipe and Bolt Threading Machine. Description and complete specifications are included.

Cameron Machine Co., 61 Poplar St., Brooklyn, N. Y.—Paper mill production executives will be interested in the new 56-page catalogue just published by this company. More than 35 distinct types of slitting and roll winding machines are illustrated in this catalogue, the types ranging from heavy duty mill type winders to narrow width slitting and roll winding machines designed to reclaim damaged and telescoped end rolls. There is also an interesting comparison of various slitting methods, and description of the latest developments of the company in the way of improved cutters, new high speed slitters, new type slitters for transparent cellulose material and also a water-cooled mill roll brake for slitters operating at high speed.

Combustion Engineering Co., 200 Madison Ave., New York—An 8-page catalogue covers general specifications for this company's line of horizontal return tubular boilers. Both riveted and fusion welded construction for the shells is shown and various details of the boilers, grates breechings, etc., are included, as well as general information on settings. These boilers were formerly known to the trade under the names of Casey-Hedge and Walsh-Weidner.

Jenkins Bros., 80 White St., New York—The following circulars are just off the press and will be sent on request: No. 159, Jenkins Regrinding Iron Body Gate Valves; No. 160, Jenkins Twin-Bolt Gate Valves; No. 162, Jenkins Bronze Gate Valves.

Metal & Thermit Corp., 120 Broadway, New York—A 16-page illustrated booklet shows applications of various Murex Electrodes and contains considerable technical data including principles of design and operation, as well as physical properties and chemical analyses of deposited metals. The booklet is attractively presented with a black, orange and silver cover.

Policyholders Service Bureau, One Madison Ave., New York—This Bureau has issued a report entitled Methods of Handling Customer Complaints which is based upon one of their surveys and offers in some detail a discussion of the methods used by manufacturers, wholesalers and retailers in making sure that complaints receive proper attention and are settled satisfactorily. Case studies are presented and illustrated with reproductions of the forms used in recording the receipt and handling of various complaints. Copies available from the Bureau, which is operated by the Metropolitan Life Ins. Co.

Pyrometer Instrument Co., 103 Lafayette St., New York—Bulletin No. 60 illustrates and describes the new Pyro surface pyrometer, embodying many advanced features. Copies on request.

Smith & Winchester Mfg. Co., South Windham, Conn.—A folder just received gives a detailed description of a new bag machine made by this company, an important feature of which is the photo-electric cell, side register control. The manufacturer claims this device holds side seam variations to less than 1/16 in.

BOOKS

U. S. Department of Commerce, Washington, D. C.—The Bureau of Standards has just released Circular C407, Standards for Paper Towels, by Bourdon W. Scribner and Russell W. Carr. Copies may be obtained from the Government Printing Office at Washington for 5 cents each.

◆ Speakers Scheduled for Superintendents Convention

A tentative schedule of speakers for the Sixteenth Annual Convention of the American Pulp and Paper Mill Superintendents Association has been announced. The meeting will be held June 5, 6 and 7 at the John Marshall Hotel, Richmond, Va. William H. Brydges, general superintendent of the Bedford Pulp & Paper Company, is general chairman of the convention.

General Session

Subjects announced for the general session include:

"Conversion of Southern Pine Into Ground Wood Pulp and Sulphite Pulp," by William G. MacNaughton, assistant director of the Pulp and Paper Laboratory at Savannah, Ga.

"Dyestuffs: Some Important Factors Affecting Their Use in Paper Making," by J. Carl Schmidt, technical demonstrator of E. I. DuPont de Nemours & Co.

"Cost Control in the Finishing Department," by Wallace Shymanski, of Marathon Paper Mills Company.

"Centrifugal Stock Pumps for Pulp and Paper Mill Use," by William Gargan, assistant chief engineer, Goulds Pumps, Inc.

An illustrated lecture on "The Production and Uses of Sulphur," by the Department of the Interior.

Other speakers to be heard at this session are: A. H. Natwick, assistant general manager of the Crown Williamette Paper Company; Dr. Harold R. Murdock, research director, Champion Fibre Co., Canton, N. C.

Sulphite Group

Vance P. Edwardes, Chairman

The meeting of this group will be featured by the presentation of the following papers:

"Savings Possible for the Superintendent through Improved Digester Practice," by L. C. Kelley, manager, Restigouche Company, Ltd.

"Sulphite Digester Circulation," by A. R. MacAllister, Babcock & Wilcox Co.

Book and Fine Papers

Charles Champion, Chairman

This group will be addressed by M. S. Kantrowitz, technical director of the Government Printing Office at Washington, on the subject "Paper Troubles Encountered at the Government Printing Office."

"Another address on the subject "Toledo Beater Control" will be given by Cash Bryan of the Strathmore Paper Company and George D. Ormsbee of Toledo Scale Co.

The third paper scheduled for this meeting will be given by E. S. Berges, manager of the roll department of Farrel-Cirmingham Co., Inc., on "The Importance of Calender Stack in Paper Manufacture."

Board Group

S. M. Hesser, Chairman

R. R. Baker of the Westinghouse Elec. & Mfg. Co., will address this group on the subject "Application of Individual Motors to the Wet Section of Paper Machines."

Another paper on the subject "The Modern Wet End of Board Machines," will be given by Allen Hyer, of the Black Clawson Company.

"Features of the Suction Felt Roll and Adjustable Control Top Press Roll Drive," will be the subject of an address by C. L. Ellis, Downingtown Manufacturing Company.

Dr. R. W. Mitchell, technical director of the Magnus Chemical Company, will read a paper on "Soap, Felts and Slime."

Ground Wood Pulp Group

O. B. Ingalls, Chairman

This group will hear a paper on "Grinding Pulp with the Latest Type Great Northern Grinders," by George K. Walker, superintendent of Finch Pruyn & Company.

John A. Weiner, superintendent of the Oswego Board Company, will present a paper on "Making Pulp for One of the Newer Products Insulation Board."

"Care and Preparation in Making Pulp for the Better Grades of News Print," will be the subject of a paper by

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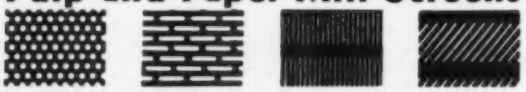
Pulp and Paper Mill Screens



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For The Papermaker's Library

Papermaking Research Around the World, by Dr. Louis E. Wise.

Identification and Microscopy of Woods and Wood Fibers Used in the Manufacture of Pulp, by Ellwood S. Harrar and J. Elton Lodewick.

Lessons in Paper Making, Part 1, by Harry Williamson.

Lessons in Paper Making, Part 2, by Harry Williamson.

Practical Helps for the Mill Man.

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Everett H. Strout, superintendent of the Livermore Falls mill of International Paper Company.

Mr. Ingalls, who is superintendent of the Pejepscot Paper Company, one of the oldest producers of newsprint in the United States, is a recognized expert on groundwood himself, and will lead a general discussion on that subject.

◆ Important Import Developments

The last month has witnessed some important developments involving imports of paper to the United States, according to a report issued by the Import Committee of the American Paper Industry, which has been active in behalf of the domestic industry in all of the cases referred to.

Developments involving the pending reciprocal trade agreements are listed as follows:

Belgium—After a month's delay, during which time efforts were made by affected American industries to prevent the reduction of duties on Belgian merchandise, the Belgian reciprocal trade agreement was formally proclaimed on April 1, effective on May 1. The proclamation announced that various countries, including Canada, now discriminating against the United States, will only be allowed the benefit of the new low rates for six months unless they meanwhile enter into trade agreements with this country. Those countries, including Germany, which have formally denounced existing treaties, will cease to benefit by the Belgian rates after the present treaties are abrogated.

Haiti—The conclusion of a trade agreement with Haiti is announced, effective upon ratification by Haiti. This agreement makes no concession on United States exports of paper to Haiti, though such concessions had been asked by the American Paper Industry.

Canada—The American Paper Industry made a strong presentation of its attitude on reciprocity with Canada when the formal hearing was held on March 18. Unless true reciprocity was to be effected, the paper industry expressed its opposition to any change in existing conditions with regard to trade with Canada.

Cuba—The first four months of trade under the Cuban reciprocal trade show a material increase in the volume and value of paper exports from the United States to Cuba. Nearly every grade of paper benefitted by the reduced rates granted by Cuba, and the increase is presumably a diversion of purchases formerly made in Europe or Canada.

The Commissioner of Customs has issued a ruling that Customs officials are to consider colored and other ground wood papers dutiable, if they are of such kinds or colors that they are not clearly standard newsprint. The burden of proof that such papers are chiefly used by newspapers is to be placed on the importers.

The United States Customs Court has rendered a series of two decisions in which a renewed effort of importers of bristol to secure a low duty rate is once more defeated. In the case of bristol, the merchandise was calendered and the claim was made that it was paperboard, calendered or coated, and therefore more specifically provided for at a duty rate of 30 per cent than as bristol. The Customs Court upheld this contention. The second case involved X-Ray screens, in which high priced chemicals are used with a cardboard base. The importers claimed this merchandise was coated paper, but the Customs Court holds that it is dutiable as coated cardboard.

◆ ◆ ◆

PUBLISHER'S STATEMENT OF CIRCULATION

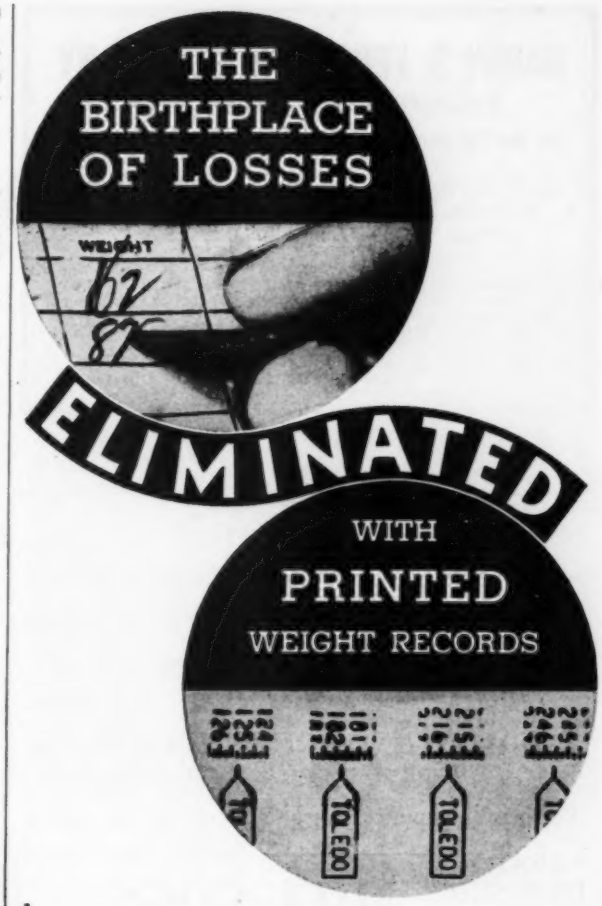
This is to certify that the average circulation per issue of THE PAPER INDUSTRY for the six months' period July 1st, to and including December 31st, 1934, was as follows:

Copies sold	3770
Copies distributed free	680
Total	4450

(SIGNED) Edward B. Fritz, Publisher.

SUBSCRIBED and sworn to before me on this 30th day of April, 1935.

JANE A. DEWITT, Notary Public.



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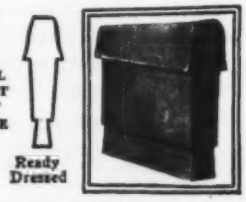

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The Paper Industry Safety Contest

July 1, 1934 to June 30, 1935

Nine Months Cum. Scores as of March 31, 1935

18 Mills Still in the Race

PERFECT SCORES

Division I—Paper and Pulp Mills

	PARTICIPANT	MILL	LOCATION
GROUP A			
GROUP B	St. Croix Paper Co.	Woodland	Maine
GROUP C	Escanaba Paper Co.	Escanaba	Michigan
	Crystal Tissue Co.	Middletown	Ohio
GROUP D	Kimberly-Clark Corp.	Lakeview	Neenah, Wis.
	International Paper Co.	Webster	Orono, Maine
	Bird & Son, Inc.	Phillipsdale	Rhode Island
	U. S. Envelope Co.	Morgan Paper Co. Div.	Lititz, Pa.
	International Paper Co.	Livermore	Chisholm, Maine
	Spaulding Fibre Co., Inc.	New Mill Plant	Milton, N. H.
	International Paper Co.	Riley	Maine
	U. S. Gypsum Co.	Gypsum	Ohio
	Spaulding Fibre Co., Inc.	Hayes	North Rochester, N. H.
	Mead Paperboard Co.	Rockport	Indiana

Division II—Remanufacturing

Container Corp. of America	Natick	Massachusetts
Texas Corrugated Box Co.	Dallas	Texas
Southern Container Co.	Houston	Texas
U. S. Gypsum Co.	Genoa	Ohio
Bemis Bros. Bag Co.	East Pepperell	Massachusetts

IMPERFECT SCORES

	Key Number	Rank	Disabling Injuries	Frequency Rate
GROUP A	P-108	1	10	5.733
	P- 27	2	11	5.813
	P- 64	3	8	5.976
	P- 18	4	9	6.229
	P- 19	5	7	6.742
	P- 30	6	8	7.311
	P- 62	7	11	7.524
	P- 13	8	11	8.349
	P- 23	9	8	8.784
	P- 67	10	17	10.345
	P- 31	11	14	11.256
	P- 12	12	11	11.699
	P-114	13	15	12.244
	P- 44	14	15	13.444
	P- 60	15	16	13.536
	P- 1	16	22	14.093
	P- 95	17	14	14.355
	P-101	18	17	17.429
	P-102	19	28	18.499
	P- 2	20	22	22.061
	P- 28	21	72	22.651
	P- 78	22	27	26.080
	P- 87	23	34	26.372
	P- 74	24	52	44.496
	P- 71	25	56	56.311
GROUP B	P- 68	2	4	5.664
	P- 21	3	5	6.479
	P- 25	4	5	8.085
	P- 70	5	7	9.911
	P-112	6	7	10.130
	P- 10	7	9	10.348
	P- 11	8	6	10.706
	P- 40	9	10	12.424
	P- 80	10	13	17.935
	P- 22	11	12	18.442
	P- 46	12	11	19.808
	P- 45	13	17	22.265
	P- 76	14	13	23.620
	P- 16	15	15	24.428
	P- 26	16	19	26.231
	P- 82	17	18	26.427
	P- 32	18	19	27.999
	P- 77	19	18	32.477
	P- 73	20	22	33.328
GROUP C	P-100	3	1	2.456
	P- 72	4	2	4.044
	P- 3	5	4	7.580
	P- 56	6	4	7.756
	P- 89	7	3	11.544
	P- 61	8	5	13.389
	P- 17	9	5	16.502
	P- 43	10	6	18.095
	P- 51	11	10	18.740
	P- 59	12	10	21.395
	P- 88	13	8	23.301
	P- 79	14	11	24.193
	P- 29	15	9	25.823
	P- 4	16	9	26.669
	P- 33	17	10	27.841
	P- 75	18	9	27.853
	P- 41	19	10	28.704
	P- 49	20	9	28.905
	P- 48	21	12	29.413
	P-104	22	18	33.373
	P- 14	23	10	36.759
	P-113	24	14	44.535
	L- 47	25	25	66.084
	P- 50	26	24	83.992
GROUP D	P- 94	11	1	4.773
	P-109	12	1	5.765
	P- 6	13	2	7.940
	P-110	14	1	12.133
	P-103	15	3	12.165
	P- 42	16	2	15.273
	P- 7	17	4	18.869
	P- 93	18	2	20.313
	P- 24	19	4	24.872
	P-107	20	6	25.397
	P- 99	21	3	29.352
	P- 5	22	8	31.353
	P- 90	23	8	32.084
	P- 8	24	6	47.366
	P- 81	25	12	49.347
	P- 98	26	12	75.645

Division II

R- 5	6	4	5.870
R- 6	7	5	6.140
R-10	8	3	6.758
R- 3	9	1	7.366
R-15	10	2	7.784
R- 2	11	6	13.184
R- 9	12	4	16.265
R- 1	13	10	32.151
R-13	14	8	39.762

No March Report: P-88, P-89, P-114
No February or March Report: P-73

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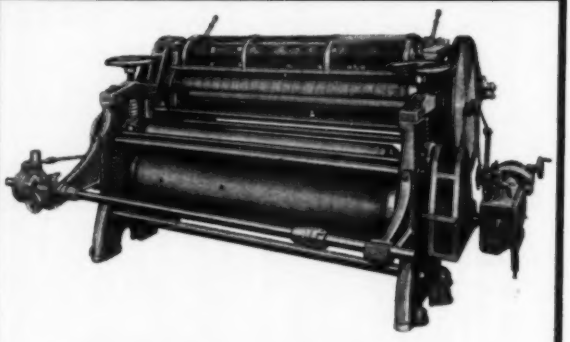

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POWER

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This section turns the searchlight on power and its allied problems, showing big possibilities to save. Opportunities to improve conditions, methods, apparatus will be discovered. Worth while practices suggest new ideas and wider usages of equipment.

By W. S. JOULE

◆ How Air is Removed From Feed Water

There has been much interest during the last few years in the matter of corrosion where piping and boiler and economizer tubes and plates are eaten away internally by chemical action even though water is free from all impurities except gases absorbed from the atmosphere. It is now well known that this destructive action is due to the dissolved oxygen in the water and that it can be prevented if the oxygen is removed from the water.

For the removal of this dissolved oxygen two general methods have been developed both of which are in practical use. One of these is somewhat of a chemical nature and consists in the use of a degasifier which allows the water to come in contact with a mass of scrap material, hence the water finally fed to the boiler is practically free of gas. Such a process is used in the Kestner degasser used mainly in Europe and the Speller process which is used in this country. This general method is employed in the Deactivator.

De-aeration by reducing the partial gas pressure and increasing the water temperature is the second scheme which is used. Fundamentally the process employed consists of heating the water to its approximate boiling point and then injecting it into a chamber under a vacuum.

◆ Test to Check Deterioration of Lubricating Oils

To determine the condition of a lubricating oil the following simple test can be made in the power plant. This test will show if an oil is beginning to break down and is consequently becoming dangerous to use, or if a new oil has been acid-treated. The test is made with a tall 4 oz. (114 c.c.) sample bottle. The bottle is first sterilized by boiling in distilled water, then 1 oz. (28 c.c.) of distilled water is added to 1 oz. of the oil to be tested. The bottle containing the oil and water is heated in a water bath up to 180 deg. Fahr. (83 deg. Cent.), corked and shaken vigorously for five minutes. After standing three hours the condition of the liquid is noted. A good filtered oil, not broken down and free from acid, will completely separate from the water with no layer or line of emulsion between the oil and water and will retain its clearness and original color.

To aid in measuring the liquids in this test, the 4-oz. bottle may be graduated at the 1-oz. and the 2-oz. points by making a horizontal line with a file on the outside of the bottle. Several bottles may be marked in this way, so that comparative tests may be conducted on several oils at the same time and under the same conditions. In this way an oil in use may at times be compared with new oil to see if it is beginning to break down and become dangerous. This test can easily be applied to turbine oils in the plant where they are used. After a little experimenting an oil that is beginning to break down or contains acid can readily be distinguished.

This emulsification test is important for oils used in steam turbines, splash feed, crank-case steam engines and circulating oiling systems. In some cases, oil must separate from water readily and retain this property during use. With motor oils a filtered oil can be detected from an acid-treated oil.

Color does not indicate the lubricating value of an oil. Highly filtered oils are paler than other oils of the same viscosity, but the color can also be lightened by acid treatment. Heavy oils have deeper colors than light oils. Red engine oils should be clear when held toward the light in a sample bottle. Cylinder oils are green in color instead of black if free from tar. All mineral oils show more or less "bloom" or fluorescence, unless it is removed. Oils should be free from turbidity, which indicates impurities.

◆ POOR CIRCULATION of water in a boiler results in the sticking of steam bubbles to heating surfaces, which will mean poor efficiency in the boiler. It may mean, also, in case of a water-tube boiler, that the steam bubbles will form in the tubes, and when they break at the surface, will throw a large amount of water into the steam space, thus causing very wet steam or what is known as "priming."

◆ Control of Feed Temperature to Economizer

As economizer tubes begin to sweat when the initial water temperature is reduced to 120 deg. Fahr. it is important that this temperature be carefully checked. It is therefore advisable to use recording thermometers on the line supplying water to the economizer so that a check on the operating conditions may be had.

From a standpoint of efficiency, it is advisable to keep the temperature of the water as low as possible and yet not encounter the danger of condensing the vapor in the flue gases. Water temperatures of around 140 to 150 deg. Fahr. are usually maintained.

When moisture accumulates on the exterior or tubes of economizers it combines with the sulphurous flue gases to form a weak solution of sulphuric acid. Corrosion is very rapid under such conditions.

Temperature control to the boiler is also important and a recording thermometer on the feed water is advisable. The higher the temperature can be maintained the more efficient the operating conditions. This is largely a matter of heat balance and means the most efficient use of exhaust steam without any waste to the atmosphere.

◆ TO DRY OUT a generator run it with the armature short-circuited beyond the ammeter and circuit-breaker and adjust the field so as to maintain a temperature in the winding of 70 deg. C. (158 deg. F.). This should require approximately full-load current.

◆ Records Stimulate Economy

Best results can be obtained in any boiler room if the attendants perform their work along a definite routine; the various duties then become a matter of habit, and the work can be accomplished much more quickly and satisfactorily than if no routine were followed and each individual did the work that seemed most pressing at the moment.

Instruments especially need careful watching to make sure they are reasonably accurate. A regular routine of inspection and calibration should be established to prevent errors. Each day the log sheet and instrument records should be gathered up and compared with a standard which has been worked out to give best results in that particular power plant. Any variation from this standard indicates conditions which invite investigation. If below standard, some condition needs correction; if above, a determination of the cause may lead to a change in practice which will result in greater economy.

Merely keeping records has little value; to be of real benefit, the data collected must be totaled, averaged, compared with previous results and when causes of discrepancies have been determined steps should be taken immediately to correct the faults. It is the immediate showing up of poor results and prompt remedy that make record keeping profitable to the plant.

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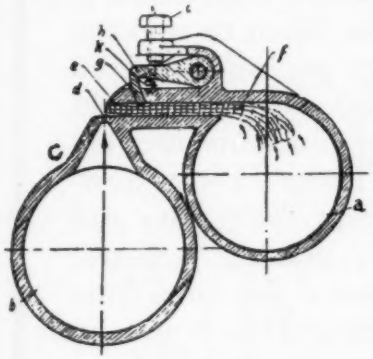
TECHNICAL DEVELOPMENTS

IN THE PAPER INDUSTRY

The following abstracts are of the latest developments found in the foreign press and in the patent offices. Photostats and translations of complete articles and patents can be obtained at cost price.

◆ Atomizer for Dampening Paper Webs

Air under pressure is blown through a slit in a pipe that is fixed across the paper web and this makes contact with a wick saturated with the liquid, thus causing dispersion of the latter. The air supply passing through pipe (b) provided with the jet sockets (c) is carried at high velocity through a fine, long slit (d). The wick (f) which fits snugly



into the long opening (e), and which enters the pipe (a) that holds the liquid, serves to carry this liquid to the edge of (d), the length of which is identical with the width of the wick (f). The amount of liquid supplied and atomized may be regulated by raising or lowering the pressure in (a), or by causing a uniform change in the cross-section of (f) over its entire width. The latter is accomplished by means of the screw (i) which acts upon a hinged lever (g) (h). A loosening of (i) has the opposite effect, (g) (h) being pressed upwards by springs (k). These operations of (i) also serve to change the dimensions of the meshes in the wick. Orion Maschinen und Apparatebau, C.m.b.H. Düsseldorf. German Patent No. 605659; K1 55e.

◆ Kraft Paper for Corrugated Packing Cases

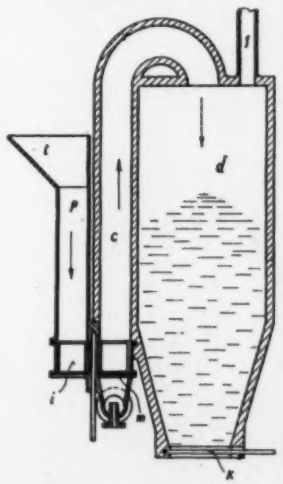
A comprehensive review by the chief engineer of the Laboratoire Général pour Emballages, at Paris, gives methods of manufacturing and qualities of kraft paper, as well as data from tests on the finished product. The latter include weight per square meter, thickness, pop tests, and Elmendorf tearing tests on samples of kraft manufactured in the U. S. A., England, Sweden, and France. As the author has drawn freely on the work of agencies in the United States, like the methods of testing of the Forest Products Laboratory, his article does not warrant more than a brief abstract. The emphasis on pulp shredders, with special reference to the Ballen shredder, which reduces 2 to 3 tons of pulp per hour, and a more recent system of beating as contrasted with the older methods, and diagrammatic references to the paper machines used in making kraft, are featured. Gösta Hall. Papier-Fabr. (T. S.) 33, No. 10, 89-96 (1935). Cf. also, Le Papier, 37, 555-560 (1934).

◆ Optical Studies on Pulps

This is the 4th and final paper of this series. [CF. THE PAPER INDUSTRY 16, No. 10, 715 (Jan. 1935) and No. 12, 881 (Mar. 1935)], in which the effect of calendering has been studied comprehensively. The methods used have been previously described. Use was made of 15 different papers whose pulp components, ash content, type of loading, coloring, and sizing, and conditions of calendering were known. These data are carefully tabulated. In the various gloss measurements, the results of which are given in a series of graphs, eight angles of illumination (ranging from 0 to 45 deg.) were used. The maxima in gloss valves usually lie at 20-22.5 deg. illumination. A higher gloss was noted in the machine than in the cross-direction of a sheet. This is not shown by direct visual observation. With increased calendering, and with increased pressure during calendering, the gloss increases until an upper limit (the so-called gloss saturation) is reached, at which point a further increase is not noticeable. This gloss saturation depends on the construction of the calender, the rate of calendering, the material of which calender rolls are made, as well as the resistance of paper to calendering. In other words, generalizations are impossible, and factors affecting gloss must be worked out for each individual calender by meeting the problems practically and noting under what conditions the gloss saturation is reached. Thus unnecessary overcalendering may be avoided. Needless to say, there may be other properties besides gloss that are desired (e. g. stiffness), and in practice such considerations will modify calendering operations. In general, an uncalendered paper (judged on a purely optical basis) shows greater brightness than one which is calendered. A more highly calendered paper shows less brightness than one less calendered. A handmade paper is brighter than a machine made sheet; the wire side is brighter than the upper side. In general, the rougher the paper surface (viewed by the photometer in the experiments described) the brighter it is, provided always the other factors remain unchanged, and provided, too, that the paper is unsized, uncolored and (especially) free from fillers. The latter, for example, have the capacity of brightening the upper side of the sheet, in contrast to the wire side. Calendering increases transparency and decreases opacity and also serves to diminish surface reflection (i. e. brightness). The introduction of fillers with a very high index of refraction serves to offset the loss in opacity resulting from calendering. Floss is practically the same on either side of the sheet provided the calendering operation has been uniform.

◆ Improvement in Bleaching Equipment

This is an addendum to German Patent No. 585146. The fibrous material to be bleached is shaken through hopper (t) and feed-line (p) into bucket wheel, where the exact amounts and the velocity with which they are to be supplied to the rising pipe (c) can be carefully controlled. As soon as the partitions (l) of the wheel are filled, the material to be bleached is blown upwards through the rising column (c) by means of compressed air which is surcharged with the bleaching agent, entering through the perforations at the bottom (m). The force of this blast serves to disintegrate



the fibers, which then sink into the chamber (d) after passing through the bend in the upper part of the apparatus. The compressed air escapes by means of the vent (f) and the fibers fall to the bottom of (d) which is emptied by the use of the slide valve (k). Gebr. Bellmar. Niefern in Baden. German Patent No. 604950.

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◆ Vacuum Pumps in the Paper Mill

A well illustrated article on the latest developments in vacuum pumps used in the service of British paper mills. After outlining the importance of vacuum pumps serving suction-boxes and suction-rolls, the author discusses the basic principles of the newer pumps which give higher vacua and greater efficiency. In the ordinary vacuum pump use is made of the kinetic energy of water in motion. Water which serves as a sealing, cooling and pumping agent revolves through the action of rotor blades. However the design is such that if the suction line is appreciably throttled, splashing and surging will result. In the older construction, the air-flow entering and leaving the rotor ports is at right angles to the desired line of motion of the water pistons. This, together with the rather small port areas in the older designs (with their high exit and entrance velocities of air), tend to prevent an even motion of the water and account for eddy losses. In experimenting with the construction of the newer pumps, attention was given to overcoming these difficulties. The rotor is built on a central web with hollow ends. The ports are located on surfaces of cones lying within the rotor and are now at the bases of the blades and have about twice the area formerly possible. Stationary ports are also larger. The water and air flow in the blades are parallel. Either head is removable and the cones are themselves separate from the heads. The performance of this new type of pump is very marked and is illustrated by a series of graphs and a table. The experiments leading to their construction included varying diameters of the cones, as well as varying lengths and pitches. In contrast to the older type, the new pumps may be speeded up during their operation with little loss of efficiency. As a result the balance between steam costs and the cost of operating the vacuum pumps has been changed. The author considers it more economical in increasing paper production on a given machine to use the existing suction rolls operated at higher vacua, than to increase the number of dryer rolls and the steam consumption. Application of the new pumps in evaporators, sulphate pulp mills, felt conditioners, etc. are suggested. So as not to raise the horsepower unduly, there are two systems of having the air pump handle air exclusively, while water is handled by a separate centrifugal. If there is a basement beneath the mill, a column as shown in Figure 1, allows a header arrangement above the wires, with ample room for a downward column equivalent to 3 feet (of water) higher than the vacuum. When the water rises against the check valve (which is shown opening into the tank at the base of the column) it will be maintained in this column until its weight overcomes atmospheric pressure. Then the water is discharged into the tank and is handled by the centrifugal pump. An alternate arrangement is a flat-box unit, of which several types are described and illustrated. It was found that when the centrifugal and vacuum pumps were built together the layout was too costly. Hence two other designs were introduced, one of which where separate air and centrifugal pumps are operated by a common motor, is shown in Figure 2. In another design (not included in this abstract) they are operated independently. Figure 2 also shows the piping to and from the separating tank. A small vacuum heating pump for the dryer exhaust is also described and illustrated. E. J. H. Norman. Paper-Maker and Brit. Paper Trade J. (Technical Sect.) 89, No. 1, 10-16 (1935).

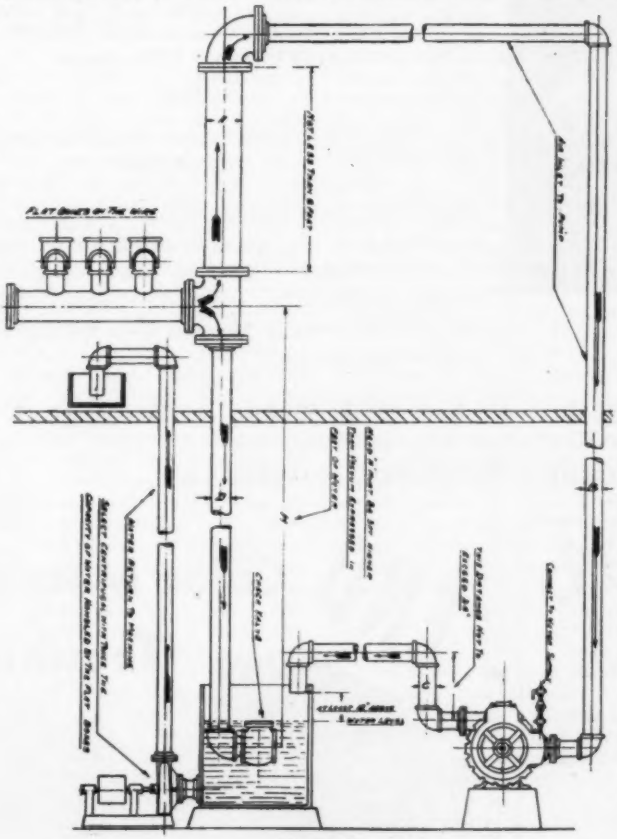

Figure 1

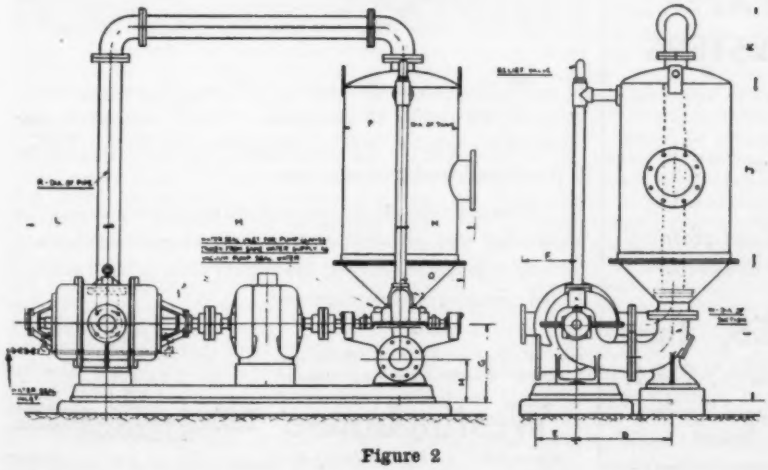

Figure 2

◆ Properties of Pulpwood and Pulp Yields Therefrom

A full report on the physical and chemical properties of spruce and pine woods in relation to their utilization in pulp manufacture. In the case of spruce that has grown rapidly, the weight of a unit volume is quite low. As soon as there are three or more annual rings per centimeter, however, this weight per volume ratio becomes practically constant at 0.39 to 0.42. Cutting sections with a thickness of 0.03 to 0.04 mm.,

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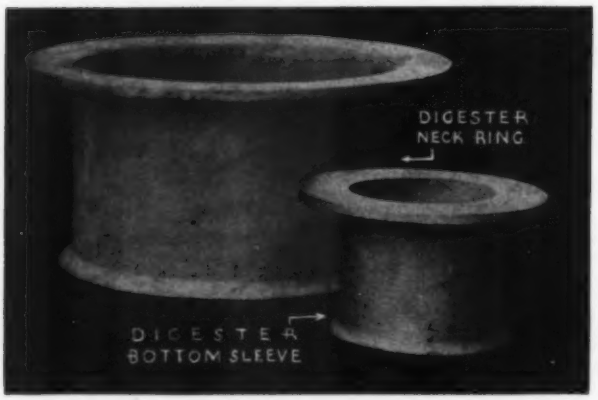

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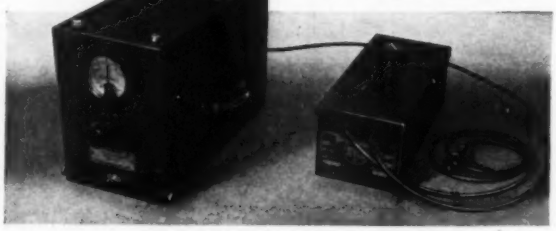

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immersing them in water, fixing them on a slide and subsequently projecting them (by means of the so-called Promi-apparatus) on a screen so that the enlargement is exactly 100 diameters is a technique that serves to show the relative distribution of fibers in springwood and summerwood. Fast growth was shown statistically and numerically to contain from 5 to 15 per cent summerwood fibers and these comprised about 2 to 9 per cent of the total volume of the wood. In slower growth the percentage of summerwood fibers usually varied from 20 to 30 per cent of the total. In the case of extremely slow growth (i. e., boles taken from trees in the northern part of Sweden) the relative percentage rose to 35. In general, as the crown of the tree is reached, the percentage of summerwood appears to decrease. A careful study was made of the length and breadth of fibers. Spruce sulphate pulps, with Roe numbers of 6-7, were disintegrated in water, the fibers mounted and fixed, and again magnified to 100 diameters by projection. Thereupon the fibers could be readily measured and separated into groups. These were classified according to varying lengths (using 0.5 mm. intervals) into classes ranging from 0.5 mm. to 6 mm., and also into classes varying in breadth from 0.02 to 0.08 mm. (using 0.01 mm. intervals). By plotting the results graphically, it was noted that at least 300 longitudinal measurements and 200 width measurements were required before adequate statistics could be obtained for a particular pulp. A summary of these results indicates that in a rapidly growing wood, the fibers are considerably shorter and wider than they are in slow growth. When growth has not been excessive, the fiber length (for spruce) ordinarily lies between 3 and 3.8 mm., and the width is almost constant at 0.04 mm. The ratio of fiber length to fiber width is important from the standpoint of the paper to be formed. In fast growing spruce woods this ratio varies from 45 to 60. In other spruce samples it varies from 75 to 90. A comprehensive chemical study indicated that ether and acetone extractives were subject to wide variations. Ether extracts as high as 5.5 to 7 per cent (which is extraordinary for spruce) were attained at times, from the wood of freshly-felled trees. These extracts were oily. After storage of the wood, the extractive content dropped perceptibly (e. g., 5.48 per cent down to 3.96 per cent within 9 months). However, the author again emphasizes what he has shown in previous researches, viz., that the acetone and not the ether-soluble extractives are the ones that interfere with delignification by the sulphite process, and that all the samples here examined (i. e., the spruce samples) are low in acetone soluble material (0.17 to 0.28 per cent). For an individual tree, the lignin content does not vary very much at different heights of the bole. The pentosan content appears to increase from the lower to the upper portions of the stem. In the physical examination of Scots pine, the variations in fiber length are much more pronounced than are the variations in fiber width—1.81 to 3.22 mm. are the extremes in length, and 0.036 to 0.046 are the extremes in width. The fluctuations in the ratio of length to width of the pine fibers lie between 41 and 86. In general, however, this figure is considerably lower than in the case of spruce. The extractives of pine, both the ether- and the acetone-soluble matter, are subject to wide variations. The pines of southern and middle Sweden are usually lower in such extractives than the pines grown in the north. The latter are often quite rich in acetone-soluble matter (ranging as high as 1.52 per cent) and such woods are entirely unsuited to the manufacture of sulphite pulp. Lignin, ash, and pentosan figures are also tabulated. In making miniature sulphite cooks only spruce was used, the wood being cut into tablets 35x4x4 mm. The cooking liquor was made from pure chemicals and contained 1.1 g. CaO and 4.5 g. SO_2 in 100 cc. Five parts of this acid were used per one part of air-dried wood, and the digestion was carried out in glass bomb tubes under carefully standardized conditions. In general, the cook required 14 hours, with a maximum temperature of 135 deg. C. The time required to reach a definite degree of pulping as judged by the Roe number did not vary materially for different spruce wood samples. This contradicts the general belief that slow growth wood requires a longer digestion period. However, in fast growing wood, the yields calculated on the bone dry basis are from 2 to 3 per cent lower than with rapidly grown spruce. When the weight per volume reaches 0.4, yield figures remain practically constant. These data are fully tabulated and expressed in various ways (per cent yield per dry wood; kg. of pulp per solid meter of wood; and no. of solid meters required to produce an English ton of 90 per cent stuff). Beating the stock from rapidly grown wood is relatively difficult, requiring 70 minutes to attain 45 deg. S.R. This is also true for wood at the crown of the tree. Other pulps require 25 per cent less beating time to reach the same degree of hydration. Fast grown spruce invariably gives the weakest pulp as shown by tearing length and pop-test. The tear resistance is correlated with the ratio between the length and the width of the fibers used. However, statements that the dimensions of the fiber are the only determining factors in all strength tests should be scrupulously avoided. The author shows clearly that there are instances where (under similar conditions of beating and delignification) a pulp containing somewhat shorter fibers may actually be stronger in certain of its properties. In other words, the quantitative morphological examination of a wood is insufficient to make a safe prognosis regarding the strength of the finished pulp. In general, those pulps which contain an appreciable amount of summerwood fiber are the strongest, but here again due reservations must be made. Sulphate pulps were made experimentally with both spruce and pine platelets, again 35x4x4 mm. Six parts of white liquor were used per part of wood. The alkali content was 20 per cent (for spruce) and 21 per cent (for pine). The sulphide content

$$\left[\frac{\text{gms. } Na_2S \text{ (calculated as NaOH)}}{\text{gms. NaOH} + \text{gms. } Na_2S \text{ (calculated as NaOH)}}\right]$$

was always 25 per cent. The digestion was carried out in steel autoclaves, kept under constant rotation in an oil bath where the temperature was raised from 50 to 140 deg. C. in the course of one hour, maintained at that point for 2 hours, and then raised to 170 deg. where it was kept for varying time periods (2 hours and 15 minutes, to 4 hours and 15 minutes), depending on the wood used, and until the same Roe number had been reached in all cases. The cooking period is longest with fast grown spruce woods. Yields from such woods are the lowest, thus being inversely correlated with higher lignin content. These marked variations in cooking time were experienced only in the case of spruce, not pine. However, in different pine samples the yields varied widely (when delignification was carried out to the same Roe number). Variations of from 43.8 to 50.9 per cent pulp were obtained. In the case of pine sulphate pulps these yields do not seem to show a relationship to the original lignin content of the wood, nor to the pentosans, but appear due mainly to the fluctuations in the densities of the pine woods used. Despite the fluctuations in time required to reach the same degree of hydration, and the variations in tearing length, Mullen test, and tearing strength of the various pine pulps, there is every indication that, statistically, sulphate pulp made from pine is about 20 per cent weaker than spruce sulphate. The article includes 19 tables. Erik Hägglund. Papier-Fabr. 33, No. 8 (T. S.) 73-78; No. 9 (T. S.) 81-86 (1935).

◆ Researches on Kraft Pulp Production

Working with pine, the investigators found that the usual yield for kraft pulp was 45 per cent. These yields may be increased to 80 per cent with a pulp which, although very dark in color and hydrated with difficulty, manifests properties with regard to strength that closely simulate those of ordinary kraft pulp. This objective was gained by introducing CaOS (calcium oxysulphide) into the cooking liquor. CaOS is formed by heating milk of lime with sulphur, in the proportions of 56 parts by weight of CaO to 32 parts of S. Very poor results were obtained by using calcium polyoxysulphide $CaOS_n$ (where n varies from 2 to 6). Liquors made by treating NaOH with flowers of sulphur require longer cooking periods, but give good yields. Digestion of the chips with calcium chloride solution prior to the cook with NaOH and sulphur had no effect. G. Dupont and I de Fayard; Chim. Ind. 31, 784 (1934); through Papierfabr. 33, No. 10 (Abstracts), 46 (1935).

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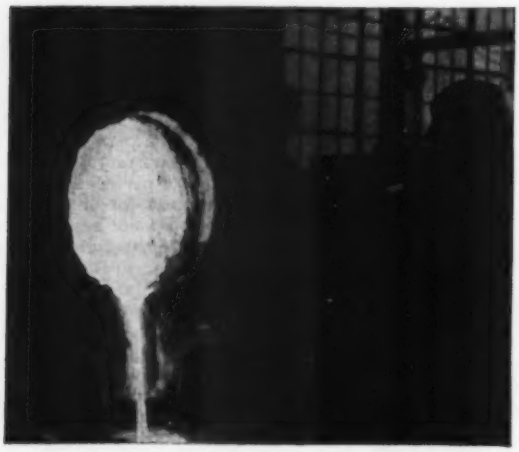

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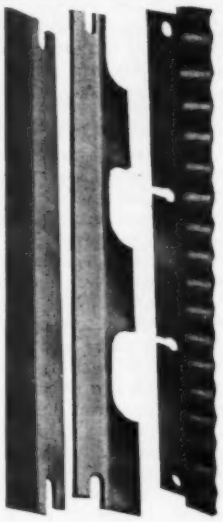

SWW Beater Bars

On the left—a standard straight bar for all ordinary beating requirements.

Center—a Dowd staggered bar; a design that will increase circulation, suction and break-up of stock; also reduce friction and lower the risk of burning.

Right—Simonds-Dayton corrugated design; stronger and particularly efficient because of the brushing action of the corrugations.

Also Simonds-Dayton vented type — not shown — and all standard patterns.

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Complete line—the new abrasive-steel combination bed plate for use on long fiber stock of which kraft, wrapping, envelope and rag are typical. Brushes and draws the fibers.

Also diamond, open center, and all standard patterns.

Paper trimming knives, chipper knives, roll bar grinders, etc.

DAYTON GRINDING WHEELS

SIMONDS WORDEN WHITE CO.
OFFICE DAYTON, OHIO
SWW SWW
Factories at DAYTON-BUFFALO-CLEVELAND-BELOIT

FELTS

There is a difference in paper machine FELTS.

If you want the best insist on those bearing this trade-mark.

The Waterbury Felt Co.
SKANEATELES FALLS, N. Y.

The COMMERCIAL OUTLOOK

New York, May 1, 1935.

PRACTICALLY all indices indicate steady improvement in the general industrial and business situation. Employment is gaining, payrolls are rising, basic manufacturing industries are increasing their production, retail business is expanding; in fact, conditions are showing gradual though certain improvement.

The latest report of the National Industrial Conference Board states that business conditions registered further gains in March and the first half of April. The continued expansion of the automobile industry and the sharp rise in building were responsible for the increase in industrial activity, the report says. Automobile output for the first quarter reached a level higher than any in the preceding eight years with the single exception of 1929. Building and engineering contracts advanced in March by more than the usual seasonal amount as compared with February, total awards being 64 per cent higher in 37 eastern states than in February. Production of the steel industry in the first quarter was 21.6 per cent above that of the corresponding period of last year.

One of the foremost commercial agencies of the country predicts a sharp business rise lies immediately ahead. This survey states that a complete transformation of sentiment has occurred, all the reports received being more decisive than at any time this year in the confident attitude taken regarding a more even tempo of progress from now on. Potential benefits of the five billion dollars appropriated by the Government have provided the stimulus needed to dispel the impatience which had appeared in some branches of industry and business because of the letdown in activity toward the close of the first quarter. In the industrial centers of the Middle West retail sales have risen 10 to 18 per cent over a year ago. In the Southwest, retail sales have mounted 10 to 12 per cent; the Pacific Coast States marked up increases of 4 to 8 per cent, and slight gains appeared in New England and the East.

The improved sentiment has spread to the paper industry. Perhaps one of the most impressive signs that this is true is that paper manufacturers have bought raw material in substantially larger volume, thereby attesting to their confidence in the outlook. In the case of wood pulp, it is reported purchases have run not only to the end of the current year but into 1936. Proof is accumulating that orders for paper have increased; most mills are reported operating at a good percentage of capacity, and in numerous instances stepping up their production to take care of the business coming in.

Along with other groups of manufacturers and business men, papermakers are looking forward to an excellent period of business during the remainder of this year. The belief is almost unanimous that the second half of the year will be far more active than the first six months. Adverse Congressional influence will have been removed, and it is felt effects of the Government's back to work program and the spending of so huge a sum of money as has been appropriated for carrying out the administration's plans cannot be other than beneficial. Some in the paper industry are anticipating a mild business boom in the last months of the year.

Newspaper advertising in March in eighty cities of the country showed a gain of more than 5,000,000 lines, or 3.6 per cent, over the same month last year, which in turn was 30 per cent better than in March, 1933, according to Advertising Age. Classified advertising, referred to as an unusually sensitive business barometer, climbed 19 per cent over March, 1934. Printer's Ink reports newspaper advertising increased 5.2 per cent in March over February of this year, after the usual adjustments for the number of days in the month and for seasonal fluctuations.

Newsprint output in the United States and Canada during March totaled 279,210 net tons, compared with 295,122 tons in the corresponding month last year. In this country the production was 73,528 tons, against 84,993 tons in March last year and 70,805 tons in February this year. Canadian production amounted to 205,682 tons, contrasted with 180,305 tons in the preceding month and 210,129 tons a year ago. March was the first month since May, 1933, in which Canadian mills reported a decline compared with the year before, according to the News Print Service Bureau.

Production of newsprint by Canadian mills during the first quarter of the current year was 587,946 tons, against 572,950 tons in the similar period last year, an increase of 14,996 tons or 2.6 per cent. United States mills in the same time produced 224,999 tons, against 241,589 tons last year, a decrease of 16,590 tons or 6.8 per cent. Mills in both countries in the three months' period produced 812,945 tons of newsprint, compared with 814,539 tons a year ago, a decline of 1,594 tons or 0.19 per cent.

Shipments of print paper from Canadian mills in March were 198,574 tons, and from United States mills 74,241 tons, a combined total of 279,815 tons, to bring about an increase in stocks at mills to 96,000 tons at the end of March, as contrasted with 89,605 tons at the end of February this year, and 61,603 tons at the end of March last year. Newfoundland in March produced 28,393 tons of newsprint, against 24,778 tons last year, and the Mexican output at 1,992 tons exceeded the output of 1,287 tons in March a year ago.

Production of paperboard in the United States in February reached a total of 249,299 net tons, according to the Census Bureau's monthly summary, showing a decline from the 266,054 tons manufactured in the month before but a gain over the 223,366 tons produced in February, 1934. However, the output in February last was at 68.8 per cent of mills' rated capacity, against 62.4 per cent in January, the smaller tonnage of production being due to the shorter month. Two months' output this year amounted to 515,353 tons, recording sharp increases over the 453,677 tons in the corresponding period of 1934, and 411,197 tons in the first two months of 1933.

New orders for board received by mills during February called for a total of 250,250 tons, against 277,780 tons in the preceding month, and unfilled orders held by manufacturers at the end of February were 83,276 tons, contrasted with 80,046 tons a month earlier.

Mills in the East are quoting $5 a ton higher on boxboards, now naming $40 per ton on newsboard and $37.50 on chipboard for sidewalk delivery in New York and other consuming centers.

◆ ◆

◆ Gair Acquires Two Canadian Plants

Robert Gair Company, Inc., has announced the acquisition of London Shipping Containers, Ltd., of London, Ontario, and of Canadian Containers, Ltd., of Windsor, Ontario.

The acquisition of the Windsor and London plants marks the further extension of the Gair interests in the Canadian paperboard industry, the Company having plants in Toronto, Campbellford, Frankford, London, Windsor, Hamilton and Montreal.

The plants of London Shipping Containers, Ltd., at London, and of Canadian Containers, Ltd., at Windsor, have been headed by Mr. Ray Lawson of London who took over the plant in that city more than 10 years ago and who in 1929 organized the Windsor plant to take care of the industrial development in that section. Mr. Donaldson succeeds Mr. Lawson in the presidency of both companies.

The plants at London and Windsor are devoted to the fabrication of corrugated shipping cases and containers and will continue to be operated by their present management, maintaining the same standards of service to their customers in both territories.

TENAX FELTS

STRENGTH

Production UP–Costs DOWN

ENDURANCE

Once more, paper mill superintendents have opportunities to run for production records. Productive hours that pile up the tonnage, and pull down the c.p.t.

And, as usual, many pleased superintendents gladly give credit to TENAX FELTS for uninterrupted runs over long periods.

STRENGTH and ENDURANCE count on the profit side of cost sheets.

"Non-Users Are the Losers"

LOCKPORT FELT COMPANY
NEWFANE, N.Y.

MEETS MODERN NEEDS

BUSY production, engineering, and purchasing executives in the pulp and paper industry do not have to use methods in their work as antiquated as methods of bygone days.

¶ The Paper and Pulp Mill Catalogue has been published to meet modern needs. It is of convenient size and well arranged for easy reference. Use it when in need of information pertaining to equipment and supplies or when some specific engineering data is required. It will save you Time, Worry and Money.

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PAPER AND PULP MILL CATALOGUE
333 N. Michigan Avenue, Chicago, Illinois

Domestic RAW MATERIALS

◆ Papermaking Rags

While most reports describe the market for papermaking rags as comparatively quiet, there are plenty of signs that buying by mills is on a fair scale and that the movement of supplies into consumption is of sufficient volume to be creative of a rather firm technical market position. It is quite true that paper manufacturers, virtually as a unit, are purchasing rag stock on a reserved basis, as they are other kinds of raw material. Few or none are stocking up; the policy in vogue is to await the development of requirements before acquiring necessary supplies, as manufacturers have found through experience they have little or no difficulty securing the raw material wanted when they need it.

However, rags—or certainly most grades of rag stock—are in a fairly healthy market condition, with consuming demand and coupled with it demand from export quarters just about or very nearly equaling the supply coming forward from collection and sorting sources. Dealers continue to issue warning to their mill customers that should consumption requirements expand only a little more, the probabilities are something of a scarcity of many grades of rags would ensue, with a consequent upturn—and perhaps a fairly sharp one—in market prices.

On the other hand, recent supply developments have been in favor of those on the buying side of the market. The spring invariably sees an increase in rag collections the country over, and incoming supplies in late weeks have shown a gain. Whether the increase has been sizable is questionable, but there has been enough of an influx of supply to cause buyers to let down a bit in their market operations, and to lead to a slight recession in prices of some rags. This has been particularly evident in the bulky roofing rag grades, which have eased in value to an extent of a couple of dollars per ton.

An important factor in the rag situation is the export of papermaking rags from the United States to Europe. Various grades of new cotton cuttings, and some old white cottons, are being shipped out of the country in substantial amounts. Mills abroad apparently are not securing all the rags desired, or else are buying needed supplies here at favorable costs, and are absorbing, in the aggregate, a fairly large tonnage out of the American market; certainly, a greater volume than in former years.

Roofing rags have sagged in price to where No. 1 domestic roofing stock is selling in the East at 1.20 to 1.25 cents per pound and No. 2 stock at 95 cents per hundred pounds f. o. b. New York. The western market is on practically these same levels, or but a shade less. New No. 1 white shirt cuttings are available at 6 cents per pound f. o. b. dealers' shipping points, fancy shirt cuttings at 2.25 cents a pound, new unbleached cuttings at 6.25 to 6.50 cents, new blue overall cuttings at 3.50 to 3.75 cents, light silesias at 4 to 4.25 cents, washables at 1.75 cents, and new bleached canton flannels at 5.50 cents. Many of these grades are moving also for export.

Old cottons are about stationary in price at 2.75 cents upward, depending on quality, for No. 1 repacked whites, 2.25 cents for No. 2 whites, 1.50 cents for twos and blues, and 1.30 cents for thirds and blues.

◆ Old Paper

The old paper market is in a rather featureless position, developing fair activity but little or no change in price levels. Board and other consuming mills are taking supplies in moderately good tonnage but not on a wide enough scale to affect ruling values; at any rate, buyers appear to be securing all the supply wanted without having to raise their prices. While there is considerable complaint among dealers anent the prices prevailing on low, bulky grades such as mixed paper and old newspapers, it is generally acknowledged the high grades are bringing relatively good values. No. 1 mixed paper is 15 cents per hundred pounds f.o.b. shipping points in the East, and folded news 22½ cents. Books and magazines are comparatively low in price on a basis of 50 cents per hundred pounds at shipping points in the East, but nearly all other descriptions are fairly high-priced. Shavings are selling at around 2.20 cents a pound for No. 1 hard white and 1.65 cents for No. 1 soft white; No. 1 hard white envelope cuttings are bringing 2.50 to 2.60 cents, No. 1 old kraft paper 95 cents to $1 a hundred pounds, white ledger stock a cent per pound and colored ledgers 75 cents per cwt.

◆ Pulpwood

Pulpwood is moving in a steady way to consuming mills in a market exhibiting little or no change and no worthwhile feature. Most manufacturers find contract supplies ample, engaging in almost no open-market operations.

◆ Mechanical Pulp

The market for mechanical wood pulp has quieted very perceptibly. One salient reason, it is presumed, is that those consumers who have their own grinding plants and who at some periods of the year are actively in evidence as buyers, now are enabled to operate their own pulp mills since there is plenty of water in mill streams, and are engaging in scant buying of groundwood. Prices have shown an easing trend, and are on slightly lower levels. Canadian prime groundwood is reported readily available at $23 per ton ex dock American Atlantic seaboard, and probably at less, while domestic groundwood selling in the open market brings scarcely more than $25 at producing plants. There has been some pressure from foreign or Scandinavian sources to sell groundwood and this has had its influence on the market here. Prime Scandinavian groundwood is reported obtainable at $20, and perhaps even a shade below this price, on an ex dock Atlantic seaboard basis.

◆ Chemical Pulp

The chemical pulp market has developed fair activity recently. Buyers have been much more in view, and in numerous cases have acquired supplies in considerable tonnage. A large business has been done by pulp producers in connection with the readjustment of sulphite prices in accordance with the new scale of open-filing minimum prices announced a couple of months ago, which reduced the established basis on bleached sulphite $5 a ton and on unbleached $4. Pulp manufacturers and importers having old contracts with paper mills have booked considerable additional tonnage of orders in readjusting prices on these old commitments.

Prime bleached sulphite is 2.50 cents upwards per pound, ex dock American Atlantic seaboard basis, and unbleached sulphite is 1.90 to 2.05 cents a pound. Domestic bleached soda pulp continues to bring 2.50 cents delivered paper mills. Such lots of domestic or Canadian kraft pulp as are sold in the open market fetch about 2 cents a pound delivered.

◆ Chemicals

Paper making chemicals rule generally steady in price. Soda ash is quoted at 1.20 cents a pound in bags f.o.b. works, and solid caustic soda at 2.60 cents upwards. Brimstone is $18 to $20 per long ton at mines. Bleaching powder holds to a quotational range of 1.90 to 2.10 cents per pound in drums f.o.b. works.

◆ Rope and Bagging

"Anything jute" is moving freely and at firm prices, by which is meant all kinds of old jute bagging are in demand, it is reported. Paper mills in some cases have paid up to 1.75 cents delivered for No. 1 scrap bagging, and it is usually admitted purchases are hard indeed to effect under a price level of about 1.35 cents a pound f.o.b. dealers' points. Old gunny bagging is actively sought and quotably strong. Roofing bagging is selling at 80 and 85 cents per hundred pounds at shipping points, and perhaps higher. Old rope, on the other hand, is comparatively quiet. Paper mills are absorbing some supply in a quiet manner and generally paying 1.75 to 2 cents a pound at shipping points for No. 1 domestic and 1.90 to 2 cents ex dock New York for No. 1 imported old manila rope. Old sisal and jute strings are in fair demand, whereas mixed strings are under buyers' neglect.

How many hours do you get out of your rolls?

TRY a single Butterworth Long Life Roll, either new or refilled, in the stack with any other rolls. Time them all. ¶ It is the extra hours that Butterworth Long Life Rolls give that has influenced some of the largest concerns in the world to use them.

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PLANTS at PHILADELPHIA and BETHAYRES, PA.

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THE DRAPER FELT

Unexcelled for strength, openness, resiliency, and general running qualities. Made to meet the most exacting conditions on all types of machines and all kinds of papers. Only one grade and that the highest.

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Import and Export MARKETS

IMPORTS

◆ Wood Pulp

Activity in the imported wood pulp market has increased substantially since the announcement on March 18 of a downward readjustment of minimum sales prices on sulphite pulp. Paper manufacturers have resumed buying, and in numerous instances have absorbed sizable tonnages of pulp for forward shipment from primary sources in Europe and Canada, in frequent cases purchasing up to the end of the current year and even into 1936. Much of the business done has been in connection with the readjustment by pulp importers and agents of prices in old contracts, the prices stipulated in these back commitments having been reduced to conform with the new and lower established minimum bases, and paper manufacturers contracting for additional tonnage of pulp at the revised price levels.

That demand for pulp would be stimulated by the price readjustment was expected, since paper and board manufacturers had held aloof from the market for some time while anticipating a change in the open-filed minimum sales bases. The price revision had been rumored for some weeks prior to the announcement by pulp producers in Europe and Canada, in conjunction with pulp manufacturers in the United States, and consumers consequently refrained from purchasing for a considerable period.

In short, confidence in the stability of wood pulp prices has been restored, and papermakers are proceeding to cover their raw material requirements freely, not hesitating to contract for shipments from abroad for some months ahead. The feeling is that chemical pulp prices will in all probability hold firm at prevailing levels for at least the remainder of the current year, and some in the trade express the belief that the next change will be upward. This, of course, is problematical, and depends on developments affecting the consumption of pulp, not alone in this country but in other important pulp-consuming countries. In the case of kraft pulp, however, it may be said the consensus of opinion is that present prices are comparatively low and it would not be surprising to many if an advance should occur, especially as kraft pulp mills in Europe are well sold up for this year and as consuming demand for such pulp is expanding steadily.

Prime bleached sulphite is selling at the filed basis of 2.50 cents upwards per pound ex dock American Atlantic seaboard, some of the extra grades bringing 2.60 and 2.70 cents, and higher. Strong unbleached sulphite of prime standard quality is 1.90 to 2.05 cents ex dock Atlantic seaboard, and prime Scandinavian kraft is 1.70 cents. It is said there has been a slackening in offerings of kraft; in fact, some Swedish mills are reported sold out for 1935 and making no further offers for this year. Scandinavian groundwood has ruled rather easy in price, and is now reported obtainable at $20 a ton for dry pulp ex dock Atlantic seaboard, and perhaps at a shade under this level.

Pulp imports into the United States dropped off during February, the decrease being seasonal since most last open water shipments from Scandinavia had arrived at U. S. ports prior to that month. Chemical pulp importations amounted to 96,965 long tons in February, valued at $3,980,928, according to U. S. Department of Commerce figures, contrasted with 160,103 long tons of a declared value of $6,083,921 in the preceding month, and 128,708 long tons of a value of $5,003,543 in February, 1934. The combined imports in the first two months of the current year totaled 257,068 tons, against 253,619 tons in the same time last year.

◆ Paper Stock

Imports of rags for papermaking into the United States in February amounted to 6,703,529 pounds, valued at $57,290, according to official Department of Commerce statistics, showing a decline compared with 9,782,416 pounds of a declared value of $104,727 imported in the same 1934 month. Receipts during the first two months of the current year reached 16,520,000 pounds of a value of $171,102, against 13,336,487 pounds of a value of $164,378 in the same time last year. Imports of miscellaneous paper stock, embracing old rope, bagging, waste paper, etc., were 3,892,475 pounds of a value of $56,052 in February last, contrasted with 4,509,740 pounds of a value of $72,583 in the similar month a year ago, and for the first two months of this year 9,502,819 pounds of a value of $137,401, compared with 8,947,074 pounds of a value of $147,520 last year.

◆ Paper

Imports of paper and paper products into the United States during February declined 13 per cent as compared with the preceding month, although exceeding February, 1934, receipts by 8 per cent, according to U. S. Department of Commerce figures. Total imports were valued at $5,540,584, against $6,399,259 in January last, and $5,129,203 in February a year ago. Newsprint consignments, as usual, represented the bulk of these imports, accounting for $4,762,564 out of the aggregate importations in February this year, and representing an increase of 11 per cent over the corresponding month of 1934. Pulpboard in rolls and other boards, cigarette paper, and kraft wrapping paper made up the bulk of the remaining imports, which were valued at $778,020 in February, an increase of 7 per cent over January but a decrease of 15 per cent compared with February last year. Receipts of cigarette paper and kraft wrapping were larger, while receipts of boards showed a decided decline contrasted with January.

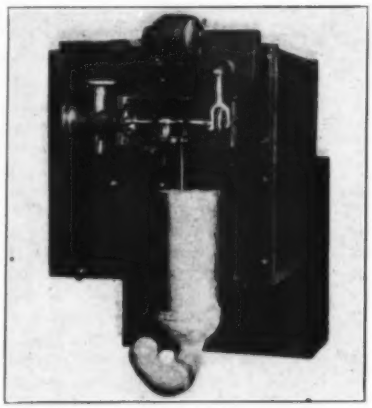
EXPORTS

Exports of paper and paper products from the United States during February were practically on a level value with the preceding month, notwithstanding that February was a shorter month than January. Compared with February, 1934, a rise in value of 14 per cent took place, which was fairly well distributed over the various items on the schedule. Mentioning first the major items, shipments of newsprint, book papers, boards, including insulating and wall boards, writing paper and paper bags were all larger than during the corresponding month last year. Shipments of old and overissue newspapers, which have grown to be a considerable item in our export trade, showed a slight decline compared with both January this year and February, 1934. A more decided decrease was noticable in wrapping paper exports, which dropped off about one-third compared with the preceding month and 12 per cent contrasted with a year ago. Shipments of greaseproof and waterproof papers, however, continued to hold up well, the January and February exports, which were about equal, exceeding the February, 1934, figure by 65 per cent. Exports of surface-coated papers, formerly among the leading items, declined 45 per cent compared with the preceding month but were correspondingly larger than during February a year ago. Shipments of toilet paper were nearly double those of last year and exceeded the January exports by 45 per cent. Total exports of paper and paper products reached a value of $1,548,207 in February, against $1,561,223 in January this year and $1,362,409 in February last year.

Exports of paper base stocks totaled in value $723,635 in February, compared with $567,470 in the same 1934 month. The largest item was sulphite wood pulp, shipments of which were valued at $599,729 in February, against $479,425 in the similar month last year.

ADVERTISING PAGES REMOVED

How Are Your Weights?



If present equipment does not give the necessary control, why not try a

TRIMBEY Weight Regulator

1250 in use on all grades and weights of paper

If you have never used the "Trimbey", or have any doubts as to the service it will give, we will gladly install one in your mill on 30 days' trial without obligation on your part.

ALSO :: KNOTTERS :: PULP SCREENS :: FREENESS RECORDERS
CONSISTENCY REGULATORS :: METERING SYSTEMS

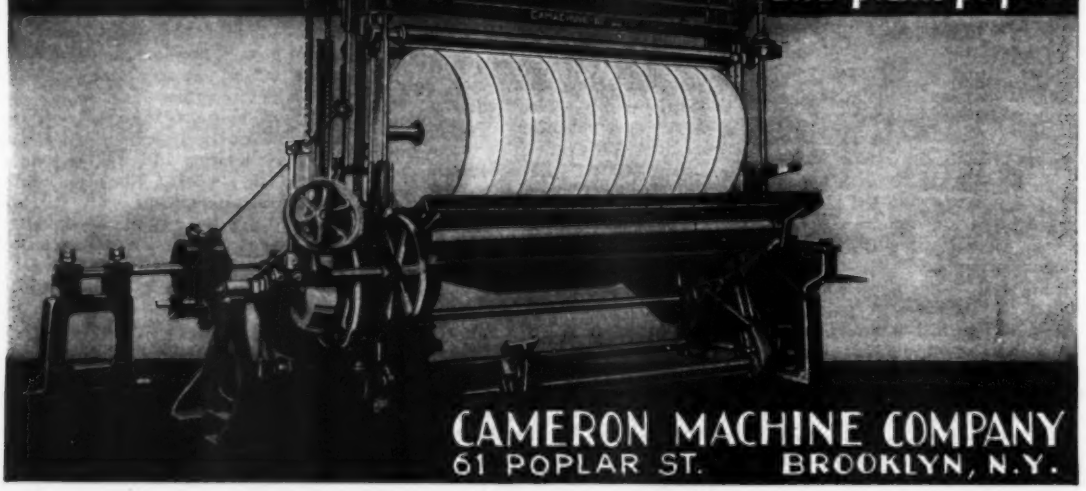
TRIMBEY MACHINE WORKS

GLENS FALLS, N. Y.

1500 FEET PER MINUTE

NEW CAMACHINE 10-5

for waxed, gummed and plain papers



CAMERON MACHINE COMPANY
61 POPLAR ST. BROOKLYN, N.Y.